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ABSTRACT

Hearings were conducted by the House of Representatives Subcommittee on Science, Research and Technology to discuss the role of community colleges in training technical personnel, with particular emphasis on how the National Advanced Technician Training Act of 1985 (HR 2353) would help community colleges meet this role. This bill creates a matching grant program in the National Science Foundation to help community colleges develop model programs to train and retrain technical workers by providing funds to be used to develop programs and courses, train faculty, organize cooperative programs with local industry and purchase necessary equipment. The minutes for the hearing on the bill include statements by Representatives Doug Walgren and Sherwood Boehlert. Testimony concerning the need for technical training and retraining of workers and the role of community colleges in this effort by business and educational leaders is provided by Joseph L. Hines of Community College of Allegheny County (PA), Cheryl Wilson of Mellon Bank (PA), Edward J. Slack of PPG Industries (PA), Harold Hall of Hall Industries (PA), John T. Smith of United Steelworkers of America, Jean Noble of Noble Robots (PA), Warren Anderson of Pittsburgh National Bank (PA), John H. Moore of the National Science Foundation, Sheila M. Korhammer of Northampton County Area Community College (PA), and Pat Choate of TRW (VA), H. James Owen of Tri-Cities State Technical Institute (TN), Richard T. Anderson of Waukesha County Technical Institute (WI), Michael I. Schafer of Mohawk Valley Community College (NY), and Andrew S. Korim of Community College of Allegheny County (PA). Additionally, information on the First Annual Symposium on Robots for the Handicapped; Waukesha County Technical Institute's publication, "The Business Connection: Class Schedule"; information on the National Council for Occupational Education; "Technician Supply and Demand: How Can Community and Technical Colleges Help Fill the Need?" by H. James Owen; "Criteria for Excellence in Associate in Applied Science Degree Programs," and the text of HR 2353 are included. (RO)

COMMUNITY COLLEGES AND TECHNICIAN TRAINING

ED269089

HEARINGS

BEFORE THE

SUBCOMMITTEE ON
SCIENCE, RESEARCH AND TECHNOLOGY

OF THE

COMMITTEE ON
SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

FIRST SESSION

SEPTEMBER 30; NOVEMBER 19, 1985

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*Ranking Republican Member.
**Serving on Committee on the Budget for 99th Congress.

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COMMUNITY COLLEGES AND TECHNICIAN TRAINING

MONDAY, SEPTEMBER 30, 1985

House of Representatives,
Committee on Science and Technology,
Subcommittee on Science, Research and Technology,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:45 a.m., at the Parkway West Area Technical School, Old Steubenville Pike, Oakdale, PA, Hon. Doug Walgren presiding.

Present: Representatives Walgren and Boehlert.

Staff present: Robert O'Neill and Maryanne Bach.

Mr. **Walgren**. I want to welcome everyone to this hearing of the Subcommittee on Science, Research and Technology. The purpose of today's hearing is to discuss the role of community colleges in training technical personnel. In particular, we wish to examine how the National Advanced Technician Training Act of 1985 would help community colleges meet this challenge. The subcommittee is fortunate to have a group of interesting and knowledgeable witnesses who will share their special perspective on the application of new technology in the economy.

At the outset I want to welcome Cheryl Wilson, and I want to welcome also Sherwood Boehlert.

Congressman Boehlert represents a district in upstate New York, and is the ranking Republican member on the subcommittee that I chair, of the Science, Research, and Technology Committee, and as such, has been a tremendous help in enabling our subcommittee to make a good contribution during very difficult governmental periods. I really want to express my appreciation for your coming to Pittsburgh, and also for the approach you have taken to the subcommittee's business as a whole, because without that, we would not have been able to do some of the things that the subcommittee has done in funding the National Science Foundation, and promoting a number of things that are particularly important to the Pittsburgh area. I know to your own, and we know to the Nation; and I think, in particular, that the super-computing centers, one of which will be at Pitt and Carnegie-Mellon, and one of which will also be in Cornell, which is the home base of Congressman Boehlert. So, with that as background and introduction to you, let me say I thank you for coming to Pittsburgh this morning. I'll finish with a couple of other words, and then give you a chance to introduce yourself.

The purpose of today's hearing is to make a record which we can work with in Washington in support of funding for technician training on the community college level. This is an effort that is important to Pittsburgh. It is important to the Nation. It has found support in the House of Representatives in the past. In 1984, the House of Representatives passed a relatively comprehensive educational resource bill, in which was something in the range of $20 million for technician training through community colleges, administered by the National Science Foundation, and the reason it passed then, still exists today. And, I think, looking on the optimistic side, it is fair to say that when something does pass the House of Representatives, it gathers a certain momentum. It really reflects a certain need that will result, ultimately, if we all pursue it in becoming law and becoming a reality. That's because this effort reflects underlying needs that are not going to go away. The development of new technology holds exciting possibilities for the lives of people in our future as a Nation and, certainly, in Allegheny County.

We are going through a difficult transition in Allegheny County, western Pennsylvania. Some have compared that transition to other major economic changes in our history. Some have said that it is of only equal depth to that that was involved when they brought the tractor onto the farm and resulted in literally 50 percent of the Nation's work force leaving the farm and going to the cities. The only difference that some cite in thinking that analogy is that when they brought the tractor onto the farm, no one needed to stop and think about how many unemployed horses there were. Well, there were an awful lot of unemployed horses, and they wound up in our center cities and they wound up in ways where there were many individuals abandoned, and many lives not what they could have been. There was a movie several years back entitled "They Shoot Horses, Don't They?" Well, that's not our intention, and we don't want to see this society destroying its people directly or indirectly, and we have seen in these last 4 years a lot of indirect destruction of lives from that original, tremendous economic change. People say that in the future, each of us, as workers, will have to retool our skills or retrain ourselves a number of times in a lifetime. Things are changing so rapidly that we cannot take one framework of training to fill one role and expect that to last for a lifetime, of which Mr. Boehlert will have something to say in a minute. And the truth of it is that we must have in place a retraining system that is accessible to people where they live, and this is where the magic of community colleges really outdistances any other institution we have in our society.

Allegheny County has done a very credible job in this area of retraining dislocated workers, really because we felt the need first, so we were the first to respond. If you look around Allegheny County, you find a community college with as many as 180 different locations where people can access the training that is available in the community college. I do not know that there is any other countywide organization that can quite make that statement. Perhaps there are, but nonetheless, we are certainly equal to the most developed of them. At the same time, the Allegheny County government has been active in pursuing retraining and, in fact, have provided million of our property tax dollars to promote and start the process of retraining dislocated workers in Allegheny County, and we have a track record that we can be truly proud of. So, in a sense, we can come to Pittsburgh and take back to Washington an example of what can be, and really, what should be, for many, many other parts of the country. And at the same time, we hope to feed back to Allegheny County some of the resources that would be provided under this bill to do our own job better.

The community colleges are really essential in this process, because, with that many campuses, and that kind of a flexible approach, they are the most accessible. They are the ones who can incorporate day care in their local campus, near to homes and the like, in a way that is truly accessible and does not involve our taking young children from their community into a downtown metropolitan area or something like that.

Allegheny County Community College, as I understand it, almost half, if not more than half, the students in their programs are not there immediately after high school. They are there because they are choosing to come back to try to develop some greater skills to offer to our work force, and, in that sense, they reflect the flexibility and the accessibility of this kind of educational institution, and we would do the Nation a great disservice to walk away from that as an integral part of what we do in retraining.

I do not think there is any way that anybody in public office can underestimate the despair that many of our people have. We are, in many ways, a two-level society now. There is a thin layer of our society that is doing very well, and it is not a small number of people, and you can find them, at parties, receptions, a whole host of activities where it is clear that a whole number of people in our society are doing very well. In fact, they even were grouped into the concept of yuppies in the last several years or so. But the truth of the matter is, that there is a whole range of individuals, both of that same generation, and previous generations that are not doing very well, and when Congressmen have open meetings, these people come forward, and there are people who have literal despair because of the lack of pickup in their own society that they are experiencing in their lives, and it is, if anything, the role of Government to be sure that every individual has opportunity; and particularly for those that the economic cards stack against them that we have some avenue, some ladder that they can put their feet on for support, that provides them that degree of hope that goes into being optimistic about our own lives and energizing ourselves to make the most of each of us. If we do not provide that kind of hope for individuals, we are going to lose more and more individuals in our society, and, ultimately, we will lose the potential society as a whole, and that will diminish the prospect, even of those who have made it. And, so, we are all in this together, I guess is what I am trying to say, and, if we do not have some kinds of governmental programs that enable us to fold the areas that are having the most trouble back into the current productivity of the society, then we all become lesser as individuals and the society can never be what it otherwise could be.

So, I hope that we will see by hearing the views of people this morning from Allegheny County who have had some contact with this problem, and some success, what the potentials are, and what they might hope would be found in not only Allegheny County, but other communities across the country, with respect to technician training and the ability of many people in our society to participate in what we know will be for the future work force and the future productive roles in our society. And, it is out of the hearing of those views that we will develop a record that will be taken to Washington and can use it as literally pegs to pin the support on in the process of working for broader support from Members of Congress who do not come from our particular part of the country or are not focused on our particular kinds of problems, and so, this hearing record, I think, will go a long way in supporting the passage again in the House of Representatives of this kind of initiative, and, ultimately, we will see it's passage in the Senate. Certainly, the Senate is no enemy of retraining programs, and, ultimately, we will see this kind of program packaged in a way that it will be enacted into law and become part of the fabric of our educational structure.

[The prepared opening statement of Mr. Walgren follows:]

OPENING STATEMENT
HONORABLE DOUG WALGREN (D-PA)
CHAIRMAN
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY
HEARING ON COMMUNITY COLLEGES AND TECHNICIAN TRAINING
PITTSBURGH, PENNSYLVANIA

SEPTEMBER 30, 1984

I WANT TO WELCOME EVERYONE TO THIS HEARING OF THE SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY. THE PURPOSE OF TODAY'S HEARING IS TO DISCUSS THE ROLE OF COMMUNITY COLLEGES IN TRAINING TECHNICAL PERSONNEL. IN PARTICULAR, WE WISH TO EXAMINE HOW THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT OF 1985 WOULD HELP COMMUNITY COLLEGES MEET THIS CHALLENGE. THE SUBCOMMITTEE IS FORTUNATE TO HAVE A GROUP OF INTERESTING AND KNOWLEDGEABLE WITNESSES WHO WILL SHARE THEIR SPECIAL PERSPECTIVE ON THE APPLICATION OF NEW TECHNOLOGY IN THE ECONOMY.

THE DEVELOPMENT OF NEW TECHNOLOGY HOLDS EXCITING POSSIBILITIES FOR NEW PROSPERITY BUT THE UTILIZATION OF THAT TECHNOLOGY REQUIRES A LARGE MEASURE OF HUMAN ADJUSTMENT. SOME HAVE SAID THAT TODAY'S TECHNOLOGICAL TRANSITION IS COMPARABLE TO THE INDUSTRIAL REVOLUTION. HERE IN THE PITTSBURGH AREA WE ARE IN THE GRIPS OF AN AWESOME CHANGE IN THE ECONOMY. THE STEEL INDUSTRY, THE LONGTIME CORNERSTONE OF THE PITTSBURGH ECONOMY, HAS SUFFERED A FIFTY PERCENT DROP IN EMPLOYMENT. AS A RESULT WE HAVE WITNESSED FIRSTHAND THE DEVASTATION BROUGHT UPON INDIVIDUALS, FAMILIES AND COMMUNITIES. NATIONWIDE, MILLIONS OF JOBS WILL BECOME OBSOLETE AND NEARLY ALL WORKERS WILL NEED SOME TYPE OF TECHNICAL RETRAINING IN THEIR JOB. ALSO, MORE THAN HALF THE JOBS IN THE FUTURE WILL REQUIRE THE USE OF SOME KIND OF TECHNICAL EQUIPMENT.

IT IS ABUNDANTLY CLEAR THAT WE MUST HAVE IN PLACE THE MEANS FOR PREPARING THE AMERICAN WORKFORCE FOR THOSE CHANGES.

COMMUNITY COLLEGES ARE CAPABLE OF RESPONDING TO THIS CHALLENGE. THEY OFFER LOW COST TRAINING PROGRAMS COMBINED WITH FLEXIBLE CLASS SCHEDULES. THESE AND OTHER FACTORS MAKE COMMUNITY COLLEGES THE MOST ACCESSIBLE OF EDUCATIONAL INSTITUTIONS. COMMUNITY COLLEGES IN PARTNERSHIP WITH LOCAL INDUSTRY WILL BE INSTRUMENTAL IN OFFERING JOB TRAINING AND RETRAINING FOR THOSE SEEKING EMPLOYMENT. AT THE SAME TIME, BUSINESS AND INDUSTRY WILL HAVE ACCESS TO THE TECHNICALLY TRAINED WORKFORCE IT NEEDS TO COMPETE IN THE WORLD ECONOMY.

ON MAY 9, 1985 I INTRODUCED THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT, H.R. 2353. THIS BILL SEEKS TO HELP IN THE ADJUSTMENT IN THE TECHNOLGICAL REVOLUTION. IT CREATES A MATCHING GRANT PROGRAM IN THE NATIONAL SCIENCE FOUNDATION TO HELP COMMUNITY COLLEGES DEVELOP MODEL PROGRAMS TO TRAIN AND RETRAIN WORKERS OF ALL AGES. EACH GRANT WOULD BE MATCHED BY NON-FEDERAL FUNDS, SUCH AS LOCAL GOVERNMENT AND PRIVATE INDUSTRY. FUNDS WOULD BE USED TO DEVELOP PROGRAMS AND COURSES, TRAIN FACULTY, ORGANIZE COOPERATIVE PROGRAMS WITH LOCAL INDUSTRY, AND PURCHASE NECESSARY EQUIPMENT.

IF TECHNOLOGY OFFERS ANY PROSPECT FOR FUTURE EMPLOYMENT IN THE PITTSBURGH AREA WE MUST HAVE THE ABILITY TO TRAIN AND RETRAIN WORKERS. THIS IS A FORMIDABLE CHALLENGE BUT PITTSBURGHERS HAVE SHOWN THEY ARE EQUAL TO ANY TASK.

Mr. **Walgren**. Well, let me recognize the ranking minority member of this subcommittee and express appreciation for his being here. Congressman Boehlert from New York.

Mr. **Boehlert**. Thank you very much, Mr. Chairman. At the outset, I wish to point out that, unlike some recent visitors to this area, I am not a prospective purchaser of the Pirates. If local money can be found, I would like to see the Pirates remain in Pittsburgh.

With that as an introduction, I will also confess that my hometown minor league baseball team, the Utica Blue Sox, is a farm team of—pardon the expression—the Phillies.

Mr. Chairman, ladies and gentlemen, I am pleased to be here in the 18th District, the district of my chairman. I am particularly eager to hear testimony on the subject which the chairman and I have a similar interest in, and concern about, and that is the role of community colleges and technical schools in preparing our youth, and our present workforce, to meet an ever-increasing technically oriented world. Just a week from today, the chairman and I will visit the State University of New York, College of Technology, in my home city of Utica. There, we will receive testimony focusing on the present and future role of automation and robotics, in U.S. competitiveness, and more specifically, how that translates into research programs and adequate curricula on the campuses of our technical schools and community colleges.

For one reason or another, 2-year and 4-year community colleges and technical schools are becoming the stepping stones for advanced degrees, and for U.S. industry seeking a well-trained work force. Some of the factors involved with the increasing role are the mounting costs of education, an increasingly technological nation, and the immediate need of high-technology companies and modernizing traditional industries to hire competent people. In many instances, U.S. firms cannot wait for students to complete 5 or more years of education before entering the workforce. And, in many instances, the challenges of the job and the educational benefits accompanying that job, make it very attractive for students to choose 2- and 4-year schools. Hence, these schools not only have to accommodate beginning students, but they are also the dominant institutions for continuing education.

Today's hearing is an opportunity for the subcommittee to discuss with a selected number of witnesses, their perspectives as members of the industrial or educational sector, on the personnel needs of industry, and how the community colleges can respond to this need.

The chairman has also forwarded, to those testifying, copies of legislation he has introduced which sets up a community college program within the National Science Foundation. Your comments on that Bill, as well as other possible incentives for educational training, are of interest to the subcommittee. In July of this year, I testified before the House Ways and Means Committee to urge that individual training accounts be included in the tax reform package. I am privileged to be coauthor of that concept with Congressman Dick Durbin of Illinois. It is something we are hearing a great deal about today, and it is something I would commend to your attention, because I think we ought to recognize that, despite all the headlines, which lead us to believe that things are better, and I think indeed they are—2½, 3 years ago, we had 10.8 percent unemployment, now the national rate of unemployment is down to 7 percent.

The fear I have is that there is a tendency on the part of too many people, to just say everything is rosy, things are getting better, the crisis of unemployment is behind us. Not so. We still have millions of Americans unemployed. We still have millions of Americans who fall into the category of displaced workers; people who are ready, willing and really want to go to work, but because technology has passed them by, they are not possessive of those skills needed in the work force. The measure that the chairman has provided leadership in pushing through the House—and literally he did push it through the House, I give him credit for that—is something that is of great deal of interest to me, as I know the concept of individual training comes from something of interest to you.

I hope today, that as we proceed, you would give us the benefit of your best counsel. Many of us in Washington, and I see it happen all the time, those of you who have watched these things, have witnessed our session; our Congressmen are prone to get up on the floor of the House of Representatives and say, "I have been back home in the district talking to my people." One after another, they get up and say that. I try a novel approach. I go back home to my district, and to districts like this, and listen to people. That is why I am here today. To listen and to learn. I look forward to our witnesses.

[The prepared opening statement of Mr. Boehlert follows:]

OPENING STATEMENT
HONORABLE SHERWOOD BOEHLERT (R-NY)
RANKING REPUBLICAN MEMBER
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY
FIELD HEARING ON COMMUNITY COLLEGES AND TECHNICIAN TRAINING
H.R. 2353
PITTSBURGH, PENNSYLVANIA

SEPTEMBER 30, 1985

MR. CHAIRMAN, LADIES AND GENTLEMAN, I AM PLEASED TO JOIN THE CHAIRMAN OF THE SRT SUBCOMMITTEE, MR. WALGREN, IN THE 18TH CONGRESSIONAL DISTRICT OF PENNSYLVANIA. IN PARTICULAR, I AM EAGER TO HEAR TESTIMONY ON A SUBJECT WHICH THE CHAIRMAN AND I HAVE SIMILAR INTEREST IN AND CONCERN OVER, I.E. THE ROLE OF COMMUNITY COLLEGES AND TECHNICAL SCHOOLS IN PREPARING OUR YOUTH AND PRESENT WORKFORCE TO MEET AN EVER INCREASING TECHNICALLY ORIENTED WORLD. JUST A WEEK FROM TODAY, THE CHAIRMAN AND I WILL VISIT THE STATE UNIVERSITY OF NEW YORK, COLLEGE OF TECHNOLOGY, IN UTICA, NEW YORK. THERE WE WILL RECEIVE TESTIMONY FOCUSING ON THE PRESENT AND FUTURE ROLE OF AUTOMATION AND ROBOTICS (I.E. ADVANCING TECHNOLOGIES) IN U.S. COMPETITIVENESS, AND MORE SPECIFICALLY, HOW THAT TRANSLATES INTO RESEARCH PROGRAMS AND ADEQUATE CURRICULA ON THE CAMPUSES OF OUR TECHNICAL SCHOOLS.

FOR ONE REASON OR ANOTHER, TWO-YEAR AND FOUR-YEAR COMMUNITY COLLEGES AND TECHNICAL SCHOOLS ARE BECOMING THE STEPPING STONES FOR ADVANCED DEGREES AND FOR U.S. INDUSTRY SEEKING A WELL TRAINED WORKFORCE. SOME OF THE FACTORS INVOLVED WITH THIS INCREASING ROLE ARE THE MOUNTING COST OF EDUCATION, AN INCREASINGLY TECHNOLOGICAL NATION AND THE IMMEDIATE NEED OF HIGH TECH COMPANIES AND MODERNIZING TRADITIONAL INDUSTRIES TO HIRE COMPETENT PEOPLE. IN MANY INSTANCES, U.S. FIRMS CANNOT WAIT FOR STUDENTS TO COMPLETE 5 AND/OR MORE YEARS OF EDUCATION BEFORE ENTERING THE WORKFORCE. AND, IN MANY INSTANCES THE CHALLENGES OF THE JOB AND THE EDUCATIONAL BENEFITS ACCOMPANYING THAT JOB MAKE IT VERY ATTRACTIVE FOR STUDENTS TO CHOOSE TWO AND FOUR YEAR SCHOOLS. HENCE, THESE SCHOOLS NOT ONLY HAVE TO

ACCOMMODATE BEGINNING STUDENTS, BUT THEY ARE ALSO THE DOMINANT INSTITUTIONS FOR CONTINUING ED.

TODAY'S HEARING IS AN OPPORTUNITY FOR THE SUBCOMMITTEE TO DISCUSS WITH A SELECTED NUMBER OF WITNESSES THEIR PERSPECTIVES, AS MEMBERS OF THE INDUSTRIAL OR EDUCATIONAL SECTOR, ON THE PERSONNEL NEEDS OF INDUSTRY AND HOW THE COMMUNITY COLLEGES CAN RESPOND TO THIS NEED.

THE CHAIRMAN HAS ALSO FORWARDED, TO THOSE TESTIFYING, COPIES OF LEGISLATION HE HAS INTRODUCED WHICH SETS UP A COMMUNITY COLLEGE PROGRAM WITHIN THE NATIONAL SCIENCE FOUNDATION. YOUR COMMENTS ON THAT BILL, AS WELL AS OTHER POSSIBLE INCENTIVES FOR EDUCATIONAL TRAINING, ARE OF INTEREST TO THE SUBCOMMITTEE. IN JULY OF THIS YEAR I TESTIFIED BEFORE THE WAYS AND MEANS COMMITTEE IN THE U.S. HOUSE OF REPRESENTATIVES TO URGE THAT INDIVIDUAL TRAINING ACCOUNTS (ITAS) BE INCLUDED IN THE TAX REFORM PACKAGE. THIS PROPOSAL, ENDORSED BY OVER 40 CONGRESSMEN, WOULD ENABLE THE CURRENT WORKFORCE TO SET UP TAX-FREE ITAS TO WHICH BOTH THEY AND THEIR EMPLOYERS WOULD CONTRIBUTE. THE ACCOUNTS COULD THEN BE TAPPED FOR RETRAINING PURPOSES IF A WORKER BECAME UNEMPLOYED (PERHAPS AS A RESULT OF AN OBSOLETE TRADE). IT IS ONE APPROACH BEFORE CONGRESS WHICH ADDRESSES THE FINANCE QUESTION ASSOCIATED WITH RETRAINING PROGRAMS.

Mr. **Walgren**. Thank you, Congressman Boehlert. Well, with that, let me call the first panel, and—shall we do it as a panel, or individually?

Mr. Joe Hines, a vice chairman of the board of trustees of the Community College of Allegheny County, and Cheryl Wilson, who is a graduate of the community college program—if the two of you could come forward, and we will hear first from Mr. Hines, and then Ms. Wilson, and then have some time for a little discussion between us. We appreciate it that both of you are coming.

At the outset, the witness statements will be made part of the record, and you can feel free to outline or communicate what you feel should be most emphasized in whatever way you feel would be most effective.

For the stenographer's purposes, we will try to identify ourselves at the outset, because we are making an audio tape of this, which will then be sent for transcription, and it will be important to say your name at the outset of your testimony, so that they will not put words in someone else's mouth.

Mr. Hines, welcome.

STATEMENT OF JOSEPH L. HINES, VICE CHAIRMAN OF THE BOARD OF TRUSTEES, COMMUNITY COLLEGE OF ALLEGHENY COUNTY, PITTSBURGH, PA

Mr. **Hines**. Thank you, Mr. Chairman, very much, for this opportunity. I am Joseph Hines, a vice chairman of the board of trustees of the Community College of Allegheny County. We are, indeed, pleased that the Subcommittee on Science, Research and Technology is holding this hearing in Pittsburgh, and we are honored that you have asked the Community College of Allegheny County to give testimony on House Resolution 2353, the National Advanced Technician Training Act.

I would also like to recognize the presence of Mr. Thomas Bacon, who is a member of the board of trustees of Allegheny County, and also chairman of the legislative affairs committee for the board, and, in addition, the presence of Dr. John Kraft, our president, and Mr. Andy Korim, who is vice president for institutional advancement. I know you know, especially, of Andy's inputs to this—the writing of this legislation, as well as others. He is a—we are thankful to have him, and I just wanted you to know that we have him here, and other members of the college staff.

I would also like to thank Fred Mortius, and Dr. Fred Markoff, executive dean of the college center, north, and Marty Reed, who is his assistant, for arranging this committee hearing, at the Parkway West Technical Center.

For the past 20 years, the mission of the Community College of Allegheny County has been to provide high quality, low cost, easily accessible educational programs for the residents of Allegheny County. The college has done just that, by offering technical and career programs, community service programs, developmental education, and college transfer programs, to enrich and enhance the lives of hundreds of thousands of students.

The community college has an open-admissions policy. By that, I mean that the necessary, formal documents to consider, or being considered for admission to the college is a high school diploma, or the GED. Other colleges and universities that serve Allegheny County use the scholastic aptitude test and high school class rank as a major part of their entrance requirement. No such requirements exist at the community college. This open-admissions policy permits Allegheny County students to enroll in a college program and take full advantage of comprehensive learning experiences, regardless of prior educational attainment.

When the college first opened its doors in 1966, a total of 1,516 students were involved. Today, more than 90,000 students anually enroll in hundreds of credit and noncredit classes. During these past 20 years, CCAC has grown to become the largest community college in Pennsylvania, and is ranked among the largest in the United States.

The real story of CCAC has been one of growth and change. We see it all around us. New attitudes, new jobs, new populations being served, new ways of providing educational services, new programs, and new educational opportunities for persons of all ages. We are constantly adjusting to changing demographic conditions, changing economic conditions, and a changing science and technology base.

Our scientists and engineers, and the scientists and engineers of foreign countries, have moved us into a high technology age. Applications of high technology are working in manufacturing firms, commercial enterprises, hospitals, transportation systems, and military weapons systems, and, of course, the home is the site of countless applications of high technology.

The worksite, be it a factory floor, an office, a bank, a garage, or even a hospital, has been changing significantly over the past decade. Improvements in productivity are associated with the utilization of high technology devices and processes in the workplace. We find American businesses and industries have incorporated the latest technology applications to ensure quality and to enhance productivity.

What I would like to do is—you will have reference subject to these particular remarks in toto, and so I will not get involved in statistics at this time, because sometimes they are more confusing than they are enlightening, but this is the document that has been presented to you. I would like to, just to highlight, some of the things that are appearing in here.

Because of the intensity of internal competition in all aspects of advanced technology, and the fact that the very security of the Nation is at stake, we believe that it is of permanent necessity that the Federal Government assist us in the retooling process I have been talking about, today. We urge this subcommittee to move forward with the House Resolution 2353, the National Advanced Technology Training Act. It would provide such an initial Federal commitment to what is happening on the State and local level.

One of the most encouraging phenomena of recent years has been the growth of partnership arrangements between the private corporate community and educational institutions. And I believe, shortly, you will hear from Cheryl Wilson, who will describe just one of these, such private and public commitments that have been partly successful.

They take many forms—these arrangements take many forms in the case of community colleges, like CCAC. In some cases, it may be a collaboration through a cooperative education program, enabling a student to gain practical experience in a company work setting. In another case, it may take the form of sharing the expertise of corporate personnel in a classroom setting, as part-time instructors, or on loan as full-time instructors. In other cases, it may take the form of customized job training, to address the unique personnel needs of a particular firm. In our opinion, the partnership process between community colleges and the private sector could be expanded and accelerated, far beyond it's present level. The House Resolution 2353 recognizes the advantages, however—that resolution recognizes the advantages. However, the Internal Revenue Code must be refined to provide the necessary tax incentives to induce the corporate community to be responsive to partnership arrangements with community colleges. One such piece of legislation on the Senate side is Senate bill 2-448, which would allow tax credit for firms that incur extraordinary costs in collaborating with educational institutions, such as community colleges. We do not believe that 448, as it is written, goes far enough, but at least—it is at least a step in the right direction.

We are pleased to see that House Resolution 2353 places priority emphasis on the retraining and upgrading of workers who have been dislocated by plant closings and the obsolescence of their jobs as manufacturing processes, office systems, and other work settings are automated. Here in Pittsburgh, we are in the midst of a drastic restructuring of our economy, requiring extraordinary efforts to retool workers with the skills needed in this new economy. I do not have to go into any statistics on the subject of unemployment. You are certainly aware of what has occurred, especially in this part of the State, and this part of the country.

In April 1983, you referenced the conditions of Allegheny County. Response to this situation, initiated a cooperative retraining effort, directed a cooperative retraining effort, directed toward the needs of the dislocated workers. They funded it, additionally, for the sum of $1 million, and since then, there have been, to update that, there have been two additional county injections of funds, totaling $2.5 million, or a total input into the Dislocated Worker Program of $3.5 million. That has been a county contribution, by itself. The use of these funds was limited to tuition assistance, college fees, books and supplies for the unemployed county workers, who wished to enroll in any of the colleges' programs.

What made this training program different from other training programs, is that the community college realized that it did not have to do anything different from what it had been doing—what it had always done—make everything available to the student at the college. Many, if not most, retraining programs in the country put people in categories, and assign them to training classes. The Community College of Allegheny County individualized the program for the individual person.

In some cases, we found that people did not need retraining at all. All they needed was to learn how to search for a job, how to develop a résumé, how to network, how to assess their own skills.

In other cases, it was determined that the person needed to train for an occupational field. Efforts were made to build on, or utilize their current skills and comprehension.

The primary source of, as I said, of this Dislocated Workers Program, was the county board of commissioners—the Allegheny County Board of Commissioners, but we also received supplemental grant support under the Job Training Partnership Act, the Vocational Educational Act, and Pennsylvania's Customized Job Training Program, in addition to support through equipment contributions, staff time, and advisory assistance from business firms and labor unions. And just as an aside, if I could refer to you, this is a—in this morning's Post Gazette, and I will leave it here for you. I did not have time to make copies, but—Neal Pierce is a syndicated columnist, and the title of his editorial is "Tackling Hard Core Unemployment." What it speaks to is, the—in particular, the Job Training Partnership Act, and the fact that yes, it is a very good program, in it's inception. It needs to be refined, it needs to be developed, it needs to be modified, but it is a very big step in the right direction. And, it is a Federal commitment to doing things on a local level. And that, with inputs from the State and local agencies, perhaps tend, in many, many ways, helps to solve the problem that we are experiencing.

Our experience in training dislocated workers, we believe, is an exemplary example of the pooling of resources from local government, State government, Federal Government, private businesses, both large and small, and labor organizations, to help one of the Nation's major industrial centers, move through a severe economic adjustment from a traditional steel-based economy, to an economy characterized by the development, production, and utilization of high technology. Truly a public-private effort.

In the narrative that you have for the record, here, are several examples of individuals who have been involved in the training and education offered by the community college.

In summary, the passage of House Resolution 2353 will contribute significantly to the building of human resources—the human resource base, so essential to a strong economy. High technology has already revolutionized the total spectrum of economic activity. High technology has changed America's offices, factories, and hospitals in the past several years. Robots and other automatic processes, guided by artificial intelligence, are increasingly employed in our factories. Later technology promises to have far-reaching impact on medicine, communication systems, and factory processes, and on and on.

The predictable future requires that we modernize our workforce through training for high technology occupations.

Passage of the National Advanced Technician Training Act will enable community colleges to produce the technicians needed for tomorrow's economy. Community colleges have the expertise to provide the Nation with a trained work force to design, produce, install and service advanced technology products, systems, and processes. But we need resources to fully employ our capabilities to close the technician gap. That is why we need the enactment of House Resolution 2353.

Thank you very, very much for this opportunity to provide testimony on this subject.

[The prepared statement of Mr. Hines follows:]

Short

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TESTIMONY
ON
H.R. 2353
THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT

BEFORE

SUBCOMMITTEE ON SCIENCE, RESEARCH, AND TECHNOLOGY
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

BY

JOSEPH L. HINES
VICE CHAIRMAN OF THE BOARD OF TRUSTEES
COMMUNITY COLLEGE OF ALLEGHENY COUNTY
PITTSBURGH, PENNSYLVANIA

PRESENTED AT

PARKWAY WEST TECHNICAL SCHOOL
PITTSBURGH, PENNSYLVANIA
SEPTEMBER 30, 1985

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TESTIMONY OF MR. JOSEPH L. HINES

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

SEPTEMBER 30, 1985

Mr. Chairman, we are indeed pleased that the Subcommittee on Science, Research and Technology is holding this hearing in Pittsburgh, and we are honored that you have asked the Community College of Allegheny County (CCAC) to give testimony on H.R. 2353, the National Advanced Technician Training Act.

For the past 20 years, the mission of the Community College of Allegheny County has been to provide high quality, low cost, easily accessible educational programs for the residents of Allegheny County. The College has done just that by offering technical and career programs, community service programs, developmental education, and college transfer programs to enrich and enhance the lives of hundreds-of-thousands of students.

CCAC has an open admissions policy. Other colleges and universities that serve Allegheny County use the Scholastic Aptitude Test score and high school class rank as a major part of their entrance requirement. This open admissions policy permits Allegheny County students to enroll in a college program and take full advantage of comprehensive learning experiences regardless of prior educational attainment.

When the College first opened its doors in 1966, a total of 1,516 students were enrolled. Today, more than 90,000 students annually enroll in hundreds of credit and non-credit classes. During these past 20 years, CCAC has grown to become the largest community college in Pennsylvania and is ranked among the largest in the United States.

The real story of CCAC has been one of growth and change. We see it all around us. New attitudes, new jobs, new populations being served, new ways of providing educational services, new programs, and new educational opportunities for persons of all ages. We are constantly adjusting to changing demographic conditions, changing economic conditions, and a changing science and technology base.

Our scientists and engineers, and the scientists and engineers of foreign countries, have moved us into a high technology age. Applications of high technology are working in manufacturing firms, commercial enterprises, hospitals, transportation systems, and military weapons systems, and, of course, the home is the site of countless applications of high technology.

The worksite, be it a factory floor, an office, a bank, a garage, or a hospital has been changing significantly over the past decade. Improvements in productivity are associated with the utilization of high technology devices and processes in the workplace. We find American businesses and industries have incorporated the latest technological applications to ensure quality and to enhance productivity.

Virtually all occupations, ranging from machine tool operator, to drafting technician, to nurse, to auto mechanic, to secretary require the worker to be prepared in the competencies of high technology. For the auto mechanic it means working with sophisticated engine diagnostic equipment, for the drafting technician it means working with computer aided drafting, for the secretary it means using a word processor, for the machine tool operator it means working with numerical control equipment, and for the nurse it means working with electronically controlled life support systems and exotic life-saving pharmaceuticals. Advanced technology is presently found at virtually all worksites and is incorporated in a wide range of occupations.

Because of the rapid rate at which the American economy is absorbing advanced technology, the demand for technicians to develop, manufacture, install, operate, and service the applications of advanced technology has exceeded the ability of education and training institutions to generate technicians with state-of-the-art competencies. The technician gap must be narrowed to allow our Nation to continue the quality of life at a high level and to maintain its competitive posture in the international market place.

The Community College of Allegheny County, not unlike other community colleges in Pennsylvania and in other states, is committed to playing a key role in closing the technician gap. To accomplish this, our College and other such colleges in the Nation must develop new technical training programs, update existing occupational curricula, replace out-dated instructional equipment, and upgrade faculty in state-of-the-art instrumentation, devices and processes employed in the various workplaces.

Because of the intensity of international competition in all aspects of advanced technology and the fact that the very security of the Nation is at stake, we believe that it is of paramount necessity that the Federal government assist us in this retooling process. We urge this Subcommittee to move forward with H.R. 2353, The National Advanced Technician Training Act. H.R. 2353 would provide such an initial Federal commitment.

One of the most encouraging phenomena of recent years has been the growth of partnership arrangements between the private corporate community and educational institutions. These partnership arrangements take several forms in the case of community colleges like the Community College of Allegheny County. In some cases, it may be collaboration through a cooperative education program enabling a student to gain practical experience in a company work setting. In other cases, it may take the form of sharing the expertise of corporate personnel in a classroom setting as part-time instructors or on loan as full-time instructors. In other cases, it may take the form of customized job training to address the unique personnel needs of a particular firm. In still other cases, it may take the form of lease-free instructional use of costly, highly sophisticated equipment such as a robot or the transfer of ownership of such equipment to the college.

Such partnership arrangements are of particular significance to high technology programs in community colleges because of the extraordinary high cost of state-of-the-art instructional equipment, the rapid rate of obsolescence of such equipment, and the continual need to infuse the most advanced technology into the instructional programs.

In our opinion, the partnership process between community colleges and the private sector could be expanded and accelerated far beyond its present level. H.R. 2353 recognizes the advantages, however, the Internal Revenue Code must be refined to provide the necessary tax incentives to induce the corporate community to be responsive to partnership arrangements with community colleges. One such legislative proposal is S. 448 which would allow tax credits for firms that incur extraordinary costs in collaborating with educational institutions such as community colleges. We do not believe S. 448 goes far enough, but it is at least a step in the right direction.

We would hope that the House of Representatives could join with the Senate in producing comprehensive business and industry incentives that would enhance such partnerships and explicitly identify partnership arrangements between community colleges and the corporate community as eligible for tax credits under the Internal Revenue Code.

We are pleased to see that H.R. 2353 places priority emphasis on the retraining and upgrading of workers who have been dislocated by plant closings and the obsolescence of their jobs as manufacturing processes, office systems, and other work settings are automated. Here in Pittsburgh we are in the midst of a drastic restructuring of our economy requiring extraordinary efforts to retool workers with the skills needed in the new economy.

Unemployment under any circumstance is an unpleasant and often humiliating experience. But when the unemployment is the result of the permanent shutdown of manufacturing facilities or permanent staff reductions, it is all the more devastating. In the past few years, many workers in the Pittsburgh area have found themselves lost in this region's transition from a traditional blue-collar manufacturing economy to an economy in which high technology touches almost every occupation.

In the spring of 1983 the unemployment rate in Allegheny County was over 15 percent and in some pockets of the County the unemployment rate was well over 20 percent.

Pittsburgh has suffered severely from the shock of the last national recession, the pronounced shrinking in the area's steel industry (over 21 percent of the unemployed were steel workers) and changing technology within local plants. At one time over 30 steel companies, both large and small, including makers of both carbon and specialty steel, had plants in the Pittsburgh area. Many of these firms permanently closed plants or temporarily shut down portions of their plants in recent years. In 1979, 90,000 residents were employed in the steel mills. By 1983, there were only 40,000. The spinoff unemployment in other firms led to the layoff of an estimated 100,000 workers in Allegheny County.

In April 1983, in response to this situation, the Community College of Allegheny County and the Allegheny County Board of Commissioners initiated a cooperative retraining effort directed towards the needs of these dislocated workers. The Dislocated Worker Educational Training Program was born and funded at a sum of $1 million, which was contributed to the College by the Commissioners. The use of these funds was limited to tuition assistance, college fees, books and supplies for unemployed County residents who wished to enroll in any of the College's programs.

In April 1985, CCAC completed a study and survey of participants in the Dislocated Worker Training Program which show that results far exceed original expectations for the program. During the period from the spring of 1983 to the winter of 1985, 12,618 inquiries were received. Of those inquiring, 83 percent or 10,473 actually made application to the program. Of these applicants, 73 percent were male, 27 percent were female, and 61 percent were between the ages of 26 and 45; the average age of applicants was 33 years. Fifty-six percent of the applicants indicated that their most recent job experience had been as a laborer, having held this job for over 6 years. From these applicants, 8,092 were determined eligible for retraining in the program, and of these 89 percent or 7,237 actually enrolled in College courses.

What made this training program different from other training programs is that CCAC realized it did not have to do anything different from what the Community College has always done - make everything available to the student at the College. Many, if not most, retraining programs in the country put people in categories and assign them to training slots, CCAC individualized the program for the person.

In some cases, we found that people did not need retraining at all. All they needed was to learn how to search for a job, how to develop a resume, how to network, how to assess their own skills.

In other cases, it was determined that the person needed to train for an occupational field. Efforts were made to build on or utilize their current skills and competenccies.

Unfortunately, of the 100,000 potentially eligible for the program, only 10,000 or about 10 percent were able to do something about their unemployment.

CCAC's South Campus experienced the heaviest influx of students, about 2,500 during the entire program period, due to its proximity to the steel towns of the Mon Valley, the hardest hit by plant shutdowns. Over 50 percent of the participants in the program were from heavy metal industries.

Of the 7,237 unemployed who enrolled in the program, 1,195 remained in classes this Fall. A survey of non-returning students conducted in April 1985 indicated that 78 percent or 3,340 of these students are presently re-employed, 81 percent of this group are employed full-time.

Eighty-three percent of the respondents indicated that they had not returned to their previous work. Of the respondents employed full-time, 52 percent indicated that they felt their new salary potential was equal to or better than it had been at the time they were laid off.

The primary source of financial support to train dislocated workers at CCAC has come from the Allegheny County Board of County Commissioners, but we also have received supplemental grant support under the Job Training Partnership Act, the Vocational Education Act, and Pennsylvania's Customized Job Training Program and support through equipment contributions, staff time, and advisory assistance from business firms and labor unions.

Our experience in training dislocated workers, we believe, is an exemplary example of the pooling of resoures from local government, state government, Federal government, private businesses, both large and small, and labor organizations to help one of the Nation's major industrial centers move through a severe economic adjustment from a traditional steel-based economy to a economy characterized by the development, production, and utilization of high technology -- truly a public-private partnership effort.

We would like to cite examples of dislocated workers who completed training and education in advanced technology programs at CCAC.

Two such students completed a one-year Robotic Repair Technician Training Program. Ken Black now is the owner and president of Automation Services, Incorporated, a West Mifflin based service business that maintains and repairs data information systems and electronic equipment. Michael Cseripko is now employed in Connecticut at Unimation Robotics (a division of Westinghouse Electric Corporation) as an Electro-Mechanical/Field Service Engineer. He builds robotic assemblies and manufactures subassemblies for specialized applications. The robotic Repair Technician Program was supported with grant funds under the Vocational Education Act with equipment donations from Westinghouse Electric Corporation and a strong advisory committee with industry and labor representation.

Another example is Cheryl Wilson, who received training at CCAC in a word processing program. The program received grant support under the Job Training Partnership Act and equipment and staff support from Mellon Bank.

We would like to share with you another success story concerning one of CCAC's handicapped students who turned to a career in advanced technology. Recently, Clyde Jones began a new job as an associate programmer in the Systems and Programming Department at Pittsburgh National Bank in Pittsbugh.

Clyde, who is legally blind, came to Pittsburgh National Bank from the

Institute for Training the Handicapped in Advanced Technology operated by CCAC's Allegheny Campus. The Institute was formed in the fall of 1984 with grant support from the Pennsylvania Office of Vocational Rehabilitation.

Under the direction of the Business Advisory Committee, the Institute trains 20 handicapped people per year on standard computers and other technologically sophisticated equipment. The Advisory Committee, headed by Douglas D. Danforth, Chairman of Westinghouse Electric Corporation, helped to select students, design the curriculum, and provide internships and job placement programs.

Clyde Jones was selected by Pittsburgh National Bank as an intern in the Systems and Programming Department, and his outstanding performance led to full-time employment as an associate programmer. Clyde works on computer programs using a Memorex terminal, the same model used by 99 percent of the bank's programmers. Although he is legally blind, he can follow his input of programming assignments on the terminal's screen. When Clyde reviews a printed copy of his work, he uses the Visual Tech; this device magnifies printed material and displays the enlarged images on a closed circuit television screen. Clyde also reads memos and other printed materials with the assistance of the Visual Tech.

According to Clyde, and I quote, "It's wonderful having a good job. I actually enjoy complaining about how much tax Uncle Sam withholds from my pay. Now I can start making plans for my life and advancing on a solid career path."

Clyde is one of many handicapped students who has found a productive life through an advanced technology training program at CCAC.

In summary, passage of H.R. 2353 will contribute significantly to the building of human resource base so essential to a strong economy. High technology has already revolutionized the total spectrum of economic activity. High Technology has changed America's offices, factories and hospitals in the past several years. Robots and other automatic processes guided by artificial intelligence are increasingly employed in our factories. Laser technology promises to have far reaching impact on medicine, communication systems, and factory processes. And on and on.

The predictable future requires that we modernize our workforce through training for high technology occupations.

Passage of the National Advanced Technician Training Act will enable community colleges to produce the technicians needed for tomorrow's economy.

Community colleges have the expertise to provide the Nation with a trained workforce to design, produce, install, and service advanced technology products, systems, and processes.

But we need resources to fully employ our capabilities to close the technician gap.

That is why we need the enactment of H.R. 2353.

Mr. Chairman, we thank you for this opportunity to provide this testimony on this important subject.

Mr. BOEHLERT. Thank you very much, Mr. Hines, and just let me tell you, to make you feel a little bit better, in my previous private life, before coming to Congress, I was a county executive, and had jurisdiction over a community college, Lafayette Community College, which was part of the State University of New York. I set 5,000 FTE's, so I am well aware of what the community colleges need, in their many backups and contributions, and I want to be a partner to helping you get the resources you need to do the job that needs to be done.

Ms. Wilson?

STATEMENT OF CHERYL WILSON, OF MELLON BANK, PITTSBURGH, PA

Ms. WILSON. I am Cheryl Wilson, and I am honored to present my testimony for H.R. 2353.

Perhaps the best way to explain the unemployment situation in the Mon-Valley Area, and the feeling of unemployment, is by using a metaphor:

Have you seen a flower? It is unmistakable, the beauty and vibrancy of a flower when it is receiving all of its needs. The growth, and ultimately the flowering, is indicative of its needs being met. That same flower, if water or any of its needs are withheld, will hardly be recognizable, for it will wilt and turn colors, indicating its ill health, until, finally, the lack of attention causes its death.

So it is with people. Their employment is as water to a plant. A meaningful and purposeful living can be hewn out of life, if employment is had. The fate of those living in this Nation, or the quality of life, can possibly be measured in direct proportions to employment.

So, if unemployment is rampant, that source of well-being no longer exists. This causes, and rightfully so, panic, or a multitude of other problems. It is, at best, devastating and debilitating. Thus is the situation the Mon-Valley finds itself in.

The JPIRA Program is very beneficial, especially in areas, such as Mon-Valley, where the steel mills have closed, or laid off the majority of workers. These workers need to be taught new skills, in order to obtain a new job. Most workers unemployment compensation has run out, and therefore, they need new training, which will be of minimal cost, or at no cost at all to them. The JPIRA Program provides a wonderful opportunity for these workers. I joined the program when I had totally exhausted every means of finding another position. The class I entered had a variety of displaced workers, the majority from the steel mills and Krogers Food Stores. We all had the same aim: getting skills to help in obtaining a job. To get in the program, you had to qualify as a displaced worker, and be able to type 40 words per minute with 5 errors, and also take a reading comprehension test. The program consisted of typing, shorthand, records management, machine transcription, business English, business math, financial skills, Wang word processing, resume writing, and interview skills, to name a few.

The course was taught by Ms. Rhoda Larson, from Community College of Allegheny County. The best part is that everyone could work at their own pace. The ages were, approximately, from midtwenties to mid-fifties, but we all had something in common: obtaining a skill to stay in the work force.

To show the success of this program; out of the 22 people in the first graduating class, everyone was placed. This should inspire you to continue the program.

I had worked at United States Steel for 16 years, when I found myself in a position where I needed this program. It has helped me to find a position at Mellon Bank, and get back on my feet financially. I know that there are a lot of people in McKeesport, Duquesne, and other cities that have faced high unemployment, that could utilize this program. They have to be made aware of these programs, first of all, and shown the results of persevering until graduation.

The intrinsic value of such a program for displaced, and thusly unemployed, persons, is that the incandescent lamp of hope is allowed to continue to burn, instead of being stamped out, by reducing persons, involuntarily, to the status of less than whole, which is the position unemployment places people. If the byproducts of unemployment are eroding confidence, low self-esteem, vanished dreams, tax participation lag, embittered personalities, inability to parentally function, the feeling of being overlooked, and not counting, and adverse

Thanks to the program, thanks to community college of Allegheny County and Mellon Bank, and thanks to you, who have been interested enough in a catastrophic problem, to look at one of the viable solutions—the JPIRA Program.

[The prepared statement of Ms. Wilson follows:]

STATEMENT OF CHERYL WILSON

Perhaps the way to best explain the unemployment situation in the Mon-Valley Area and the feeling of unemployment is by using a metaphor:

Have you seen a flower? It is unmistakable the beauty and vibrancy of a flower when it is receiving all of its needs. The growth and ultimately the flowering is indicative of its needs being met. That same flower if water or any of its needs are withheld will hardly be recognizable for it will wilt and turn colors indicating its ill health until finally the lack of attention causes its death.

So it is with people, their employment is as water to a plant. A meaningful and purposeful living can be hewed out of life if employment is had. The fate of those living in this nation or the quality of life can possibly be measured in direct porportions to employment.

So if unemployment is rampant that source of well being no longer exists. This causes and rightfully so panic and a multiple of other problems. It is at best devastating and debilitating. Thus is the situation the Mon-Valley finds itself in.

The JPTRA program is very beneficial especially in areas such as the Mon-Valley where the steel mills have closed or layed-off the majority of workers. These workers need to be taught new skills in order to obtain a new job. Most workers unemployment compensation has run out and therefore they need training which will be of minimumal cost or at no cost to them. The JPTRA program provides a wonderful opportunity for these workers. I joined the program when I had totaly exhausted every means of finding another position. The class I entered had a variety of displaced workers. The majority from the steel mills and Krogers foodstores. We all had the same aim, getting skills to help in obtaining a job. To get in the program you had to qualify as a displaced worker and be able to type 40 WPM with 5 errors and also take a reading comprehension test. The program consisted of typing, English, math, money counting, filing, Wang word processing, and shorthand. The course was taught by Mrs. Rhoda Larson from Community College of Allegheny. The best part is that everyone could work at their own pace. The ages were approximately from mid-20's to mid-50's, but we all had something in common, obtaining a skill to stay in the work-force. To show the success of this program, out of the 22 people in the first class that graduated, everyone was paced in jobs. This should inspire you to continue the program. I had worked at U. S. Steel for 16 years when I found myself in a position were I needed this program. It has helped me to find a position at Mellon Bank and get back on my feet financially.

I know that there are a lot of people in McKeesport, Duquesne, and other cities that have faced high unemployment that could utilize this program. They have to be made aware of the program first of all and shown the results of perservering until graduation.

The intrinsic value of such a program for displaced and thusly unemployed persons is that the incandescent lamp of hope is allowed to continue to burn instead of being stamped out by reducing persons invouluntarily to the status of less than whole, which is the position unemployment places people. If the by-products of unemployment are; eroding confidence, low self-esteem, vanished dreams, tax participation lag, embittered personalities, inability to parentally function, the feeling of being overlooked and not counting and adverse mental health, all of which have their own by-products which affect the cities of America, not to mention our own communities, adversely. Then it is safe to conclude that employment works oppositely. Community College of Allegheny County and Mellon Bank who participated in the retraining and placement of the unemployed recognize this and have moved forth with deliberate speed to help and heal the incredible affliction that unemployment caused by planning and implementing the JPTRA program.

For this many of us are appropriately grateful, but, more than that because it was people caring so much that brought us to a promised land of sorts where we can still realize the inalienable rights of life, liberty, and the pursuit of happiness. It is only fitting that we share the caring by saying if any or many cities across our great nation are strapped with indecision about what to do about unemployment, we suggest to you today that here is a model program effective I'm sure by any measurement. Perhaps the greatest thanks to be realized and the highest dividend yielded are the dedicated performances of those who have gone through the programs and now contribute toward the overall goal of high efficiency and professionalism for the insitutions that employ them.

Thanks to the program, thanks to Community College of Allegheny County and Mellon Bank and thanks to you who have been interested enough in a catastrophic problem to look at one of the viable solutions the JPTRA program.

Mr. **Walgren**. Thank you very much, Ms. Wilson. We appreciate that statement. I apologize for being out of the room for a minute or two when you started.

What did you do for United States Steel, for——

Ms. **Wilson**. I was a clerk in our production incentive department.

Mr. **Walgren**. And what kinds of skills did that involve, compared to what you are doing now?

Ms. **Wilson**. Well, the job that I have now consists of typing, Wang word processing; which I did not know anything about when I worked at United States Steel; shorthand, and those are the main skills that I use from the program.

Mr. **Walgren**. And how did you find the college program? Was it talked about in the newspaper, or in the community in some way? What sorts of outreach got to you?

Ms. **Wilson**. When I searched the newspaper looking for a position, I found an article, which told of this program at the community college, and that it would make me responsible. It interested me, so I called up the community college and got a registration form, filled it out, and they told me to come in to take the required tests for the program.

Mr. **Walgren**. And then how long was the program?

Ms. **Wilson**. The program lasted 15 weeks. It was 3 nights a week, for 15 weeks, from 6 to 9; 3 hours a night.

Mr. **Walgren**. Did you miss any nights?

Ms. **Wilson**. Yes, I did. But I—the best part of the program was that you could work at your own pace. There was a time, in the middle of the program, that I had thought that it was more important for me to make money now, because of my financial situation; that I had dropped out because of—I was employed as a babysitter, and couldn't make the hours coincidental with the school hours. But, after talking with my teacher, he left the understanding that I needed to go back to school, and that I needed to get these skills so that I can pursue a job that would be more beneficial than babysitting. I went back to the program, and, like I said, because you could go on your own pace, I proceeded to work harder to catch up, so that I wouldn't miss any of the parts that were already discussed. Therefore, I didn't lose much, only—I didn't lose any, as a matter of fact.

Mr. **Walgren**. I see. Well, Mr. Hines, how do you decide who to bring into the displaced workers program in Allegheny County? Is there an open admission to that program?

Mr. **Hines**. In a one word answer, yes. However, there are certain qualifications—they would have to meet certain definitions of a dislocated worker, such as not having worked, I believe it is for—it is 3 or 6 months of having received some unemployment compensation, something like that. There are categories. There are some who are not eligible. Someone who is working, obviously is not a dislocated worker, but may have inquired about the program, because they felt it was an opportunity to have to improve themselves.

Again, there are limitations. I am not familiar with the particular criteria, for consideration, but I can get that for you.

Mr. **Walgren**. The county, essentially, put in $1 million, and, as I understand your testimony, that was almost the only moneys used in this program, because there was not the ability to recover it from the students, at that point, in any way—or did the community college put in any kind of complimentary funds?

Mr. **Hines**. Well, initially the county did provide $1 million. Then there were two subsequent—because of two subsequent injections of funds—the aggregate, the total amount injected by the county over a 2½-year period was $3.5 million, roughly speaking. And because—and this provided money for strictly school supports. They did not impact on the student's accessability to those unemployment benefits that they were receiving. They still were able to take advantage of that. It was not considered—you mentioned about repayment—it was not considered a loan to the students. This was a scholarship, in so many words, but it went toward tuition, books, supplies, lab fees, if that is what they opted for. Some students only needed a fine tuning of skills that they already had. And maybe even not some skills, but just opening doors, such as how do you conduct yourself in an interview session—a basic—what kind of clothes do you wear? Certainly presentable, but some had not had the need to do this for 15, 20, 25 years, because they had been regular workers in an environment which did not require them to be accessible to that kind of situation.

Some did opt for a completely different program; different from what they had been involved in in the steel mill. And so, there have been some graduates of the community college with associate degrees in courses that are not related at all to what they had before. So what began as an opportunity to the dislocated worker, and it was—to them. We really did individualize the program. Assessment going in, even before they took the first class, there was a session as to what their vocational skills, and what their vocational ambitions were. An overwhelming attitude about someone 45 to 50 years old who had not been in a classroom since he was 18—that would be an overwhelming experience. So there was a readjustment—a reentry kind of assessment and going through the steps, and through the chairs. So it was a variety of situations, but very very much individualized.

Mr. **Walgren**. Now, I am thinking of this particular piece of Federal legislation, we would be providing some Federal matching funds for local contributions, and little enough of that, truthfully, because we have a cap at $500,000 in the present legislation. That certainly could be worked with—but I guess what I am asking, then, is what kinds of resources can the community college contribute on its own, let's say, to those moneys. We would require a matching contribution. Would you envision the community college being able to come up with some of their own resources, as opposed to going to the county for—but that could happen, too, of course—but what kinds of contributions could be expected from the community colleges as community colleges in this kind of a retraining effort?

Mr. **Hines**. I think, providing the instructional staff, providing the facilities, the equipment that the college has, and I suppose, even from the standpoint of experience, going out more than the public sector, and going to the private sector. Ms. Wilson described, I think, very, very well, a public-private partnership that exists. There is also on the drawing board now, I believe, legislation in the State——

Mr. **Walgren**. Now, Mellon Bank kicked in with what? How were they participants of the program?

Ms. **Wilson**. They provided the facilities, the machines that we worked with, the equipment. The community college provided the teachers.

Mr. **Walgren**. I see. So you went to a Mellon Bank location, is that right?

Ms. **Wilson**. Right.

Mr. **Walgren**. And you worked on——

Ms. **Wilson**. Their equipment.

Mr. **Walgren**. On equipment that was used during the day, or at other times, by the bank itself.

Ms. **Wilson**. Right. Now the bank has a retraining program of their own, and this was the cornerstone of it, so they put a lot in it there.

Mr. **Walgren**. Well, now, sure——

Mr. **Hines**. I was just going to speak about that a little bit. In addition to—I am familiar with that, perhaps she's working on that. In addition to—Ms. Wilson mentioned that 22 were in the first class, and they were placed, in addition to simply Mellon Bank, what Mellon Bank tried to do was to get commitments from other financial institutions in the area, so it was a community wide situation, in addition to Mellon Bank. Other banks, savings and loans, that might have a use for the particular skills that were being taught to those that were in the Dislocated Workers Program, participated in, and I do not know what percentage of commitments were outside of the bank, or those particular figures, but I know that there was the input of various institutions.

Mr. **Walgren**. And so the local businesses were able to provide a target, in terms of employment for these students—these particular students to shoot at, and that, then, had a lot to do with the structure of the program that they were involved in. How about the program as a whole, where we have gone beyond Mellon Bank, and we have gone beyond these 22 students, I am sure in these years. Do you know how many individuals have participated in the displaced workers program over these several years, and what their experience has been in terms of relatively immediate employment?

Mr. **Hines**. If I could just refer to my notes, I can tell—it says of the 100,000 eligible for the dislocated workers program, 10,000 were able to do something about their employment; 7,200 enrolled in the program. I believe there were about 12,000 inquiries; 7,200 enrolled. That was back in 198—I am sorry—since 1983; 11,095 still remain in classes that began in September; 83 percent of the respondents to a survey—and that is approximately 83 percent of 3,300, indicated that they had not returned to their previous work, but they were employed—3,300 out of initially 12,000 inquiries, and 7,200 who entered the program, were employed.

Mr. **Walgren**. So 1,000 are still in the program, and 30-some hundred are through the program and employed and that leaves only about 2,000 out of 7,000 that have yet to resolve their circumstances.

Mr. **Hines**. That is approximately right, yes.

Mr. **Walgren**. At the outset, you indicated that your program was one of general availability, where you would make the educational program of the community college available to the worker to choose, essentially, what he was interested in at that point, and that you did not have a—the philosophy was not one of a structured retraining approach.

Mr. **Hines**. Applied to the individual, yes.

Mr. **Walgren**. Have you been able to sense what sort of technician-type skills are most important for those kinds of programs? The—if we were to focus on technician training, as opposed to just general job skills, what had been the areas of success that you have experienced in the community college, and what have been some of the frustrations of not being able to offer things that you would like to be able to do?

Mr. **Hines**. I suppose that robotocism, as it turned out, is currently the data. I know that we do have, with some particular corporations, with Westinghouse; as just kind of an example, robotics training courses. Certainly the state-of-the-art computer technology, whether it be computer repair, or computer program; times have even been advanced in those particular areas, and we do offer programs related to that. As for specific programs, I am not well enough versed to present them to you at this time. If I could call on the staff that is here for the sake of——

Mr. **Walgren**. Well, maybe we can get a little supplement to the record that would be as responsive as you would like to be on that.

You know, one of the battles that goes on in this area is the location of a possible Federal program, between the National Science Foundation on the one hand, and the Department of Education on the other. We are focused on the National Science Foundation, because their responsibility is, literally, for the scientific competence in the charter of the National Science Foundation, they are given the responsibility to engage in activities to promote the advancement of science throughout the society. They have particular responsibilities in educational areas, because, obviously, if you are going to promote science, you are going to start educationally. Others argue that this program should have a home in the Department of Education, and they would like to see a Federal Department of Education being the primary deliverer of these programs. Can you give us any reactions from your institution's point of view about what you would like to see; the National Science Foundation doing the program like this? In many ways it strikes me we should start it with them, because we are, now, talking about a universal program. We are talking about models and initial experiences, and wanting them to be as good as they possibly can be, so that other programs can see what can be done, and multiply the effect.

Mr. **Hines**. My initial reaction to your question, Congressman, that the Department of Education, in its general course of responsibilities would deal with education across the board. We are here to discuss the Advanced Technicians Training Act, which is a specialized function, and I feel that at this point, anyway, initially, the National Science Foundation—and this is a personal initial reaction—the National Science Foundation would be a better place to, at least, house it for the time being, because of the specifics involved. As we get down the road, and perhaps if the—through the community college, or technical schools, that this program does become one that might be introduced, initially, as an example in the secondary school systems. Then, at that time, it may be more appropriate for the Department of Education to assume responsibilities there. But I think that the reaction that you gave initially is housing it in the National Science Foundation, with the impedence that the—benefits that it would have, I think, would be—it is a more logical place for it, at this time.

Mr. **Walgren**. I think it probably makes sense to make clear on the record that, unlike Everett Dirksen, we are not talking about a lot of money. When you take $20 million, and cap it off at $500,000 each program, you are talking about $1 million in a unit, or at a site, and if you take $1 million, although it is a lot of—certainly is a lot of money, and when you design an educational program, my instinct is if you put all the components into place, the best distribution which you can, you are probably talking about five instructors, or five professional leaders in the program, along with some equipment and some utility bills, and some tuition, and pretty soon, you have accounted for the amount of money that would be able to be put into that slot. And so, we are really talking about a model that is very finite, and very limited in scope, but we hope very targeted, and we hope very effective, so that it shows a delivery.

Mr. **Hines**. Yes. It would allow the—enable the individual needing the events, the technician, to get as much input as possible. I think it is eliminating, perhaps some layers of structure through which the funds must flow. Perhaps it would encourage that and enhance that competence.

Mr. **Walgren**. And in a larger department, you could consume an awful lot of that money before you actually delivered services.

Mr. **Hines**. Yes.

Mr. **Walgren**. Well, let me recognize my friend from New York.

Mr. **Boehlert**. Ms. Wilson, were you still with United Steel when you enrolled in this program?

Ms. **Wilson**. No, I was not. I was layed off for 2 years when I attended.

Mr. **Boehlert**. You had been layed off for 2 years?

Ms. **Wilson**. Right.

Mr. **Boehlert**. Prior to your layoff, did you sort of see the handwriting on the wall—did you see the beginning of the end of your job?

Ms. **Wilson**. No. As a matter of fact, it was very sudden. The area I worked in was where all the orders came in from the Government for the piping order. It just seemed like within a month's time, all the orders disappeared, so it was a shock to everyone that the deals had gone down so fast.

Mr. **Boehlert**. When you were involved in the program, did you incur any cost to participate in this program?

Ms. **Wilson**. No. They took care of tuition, books—all we had to do was get there.

Mr. **Boehlert**. Would it have been a disincentive if you had had to come up with some money of your own?

Ms. **Wilson**. Yes, because my unemployment had—I had one week of unemployment left when I entered this program, so my funds were totally gone. If I had to pay for tuition and books, it would have been out of the money that I needed for my family, which I could not do.

Mr. **Boehlert**. Mr. Hines, are all of your programs oversubscribed in waiting lists?

Mr. **Hines**. I believe that there is a waiting list for the dislocated workers program.

Community College Staff. There is, and the students seem to be doing a good job of selecting, in terms of knowing which fields of business that they want to go to.

Mr. **Hines**. This is the dislocated workers program?

Community College Staff. Yes.

Mr. **Hines**. Yes, there is.

Mr. **Boehlert**. First of all, are you familiar with the individual training account concept at all?

Mr. **Hines**. No.

Mr. **Boehlert**. Well, I will put it plainly to you. I am a coauthor, but it is a bill that is getting increasing attention in the Congress. Essentially, it is set up in this manner: Employees and employers would voluntarily agree to set up an Individual Training Account Program, at a given work location. Annually, each would contribute eight-tenths of 1 percent of the worker's wage, or $250, whichever is less, into an account in the name of the individual—an individual training account. It is set up, obviously, for the employee to participate, as a form of insurance.

Second, there would be 100-percent tax deduction for the contribution. For the employer would be 125-percent tax deduction. The funds would go into an individual training account that would enable the employee—and each year, contributions would continue from both sides, until a $4,000 level was reached. The money would be held by the U.S. Treasury Department, it would be invested in high-yield securities, so it accumulates an interest. Typically, what the typical worker would be paying here is when he hit that $4,000. Then the contributions would cease. Ideally, the employee would never have to use that, so comes the day that retirement is in the offing, the employee then would withdraw all of his or her contribution, plus accumulated interest—actually it would be somewhere in the neighborhood of $35,000, which is a nice supplemental retirement.

The employer would then get back the employer contribution. That is the ideal. But in the real world, that probably is not going to happen too often, because in the real world, we have too many Cheryl Wilsons, who are hard workers, show up every day 16 years on the job, and one day—it is gone. Then, that is when the ITA would come into being. The employee could withdraw, on a voucher basis, funds from the individual training account, and use that voucher to pay for training. Training in skill areas where there is a clear need and marketplace for those skills. I see this as being very compatible with the goal that my chairman has pushed forward. Because, you are giving some money to community colleges, but you also need to have somebody with cash in hand to pay for the training, because there is not enough money that is going to come out of this, or any other program that I can foresee, to pay for training for all displaced workers that we have to accommodate. So I would encourage you, Mr. Hines, and all associated with Allegheny Community College, to get more familiar with that concept, because I would envision the community colleges being a focal point for training under this program.

Let me ask you this, when you were setting up your curriculums, how did you determine which programs you were going to establish? Is there consultation with the private sector and organized labor? Do they have some input?

Mr. HINES. Are you speaking about curriculums generally, or——

Mr. BOEHLERT. Yes. Particularly to deal with the problem of displaced workers, because they are the ones I am most worried about.

Mr. HINES. To my knowledge, and I certainly will correct myself if I find that I am not correct on this, for the dislocated worker, there were no new specific programs designed, which I think is a very positive situation. In other words, depending on what that particular individual had as his goal, after the preclass assessment, they were ushered in to—or came into existing college programs. If there is—that is the part one answer to your question.

If there is shown the need for any particular program, we have a 10-step process that must be answered before any new program is approved by the college. It answers to need, cost, impact, jobwise, is it jobwise on the community—and so, we go through these steps, and it is a very detailed, intensive kind of a review before a new course is offered, so we do go through that process before it is broken and comes on to the agenda.

Mr. BOEHLERT. Is Pennsylvania like New York? In New York State, the community colleges are being very effectively utilized under the Job Training Partnership Act, where throughout the State, I would say the majority of training programs, funded under JTPA are on the community college campuses, which I think is a great project. Is that the same system as exists here in Pennsylvania?

Mr. HINES. I do not believe it is. And I will look, again, to the staff for further input, but I think that there have been some misgivings about the JTPA Program in general. When I say generally, I mean that the delivery that we were speaking to a moment ago, of service and of the product to the individuals that would utilize it, in the filtering down process, it may not always be the best dime for the buck, is the expression I might use, that the—depending upon the particular proposal of that commitment, or depending upon the process that is being used, it may not be the most cost-efficient delivery of service to the individual. I believe that the community colleges, because of just this environment, at least in Allegheny, have not utilized, or taken advantage of the JTPA fund, because of experiences with it—poor experiences that we have had.

Mr. BOEHLERT. How about in Allegheny County? Is the Private Industry Council an active viable force?

Mr. HINES. The Private Industry Council is, yes.

Mr. BOEHLERT. First of all, does organized labor participate; and second, is Government really sort of taking a hands-off position and letting the private sector do what it can do best?

Mr. **Hines**. I would have to defer to Andy Korim.

Mr. **Korim**. The Private Industry Council does have labor representation, and industry, corporate representation, and there is, to a great degree, a lot of initiative being taken by the Private Industry Council to provide that kind of expertise that is needed to adapt training to the needs that exist today.

Mr. **Boehlert**. My personal view is that there are two absolutes. There are two musts in order to succeed in this area. One is that we involve organized labor, and two is that we have minimal involvement of the Government. We do not want to see things screwed up, and have Government directing the whole thing. CETA was a classic example of a program that was well intended. Hundreds of millions of dollars—billions of dollars were pumped into that CETA Program, and all across America, you had local governments directing it, and wasting your money and mine. That is why I say under JTPA, the community colleges are the best hope for the future. I would hope to be——

Mr. **Walgren**. Gentlemen, you have—I am wondering what might explain that in New York they have used this program quite extensively, and in the Pittsburgh area we have not? If any of the witnesses have views on that, maybe you could give us a little submission on that, because that is a very interesting difference.

Mr. **Boehlert**. I can speculate, Mr. Chairman. There is a great reluctance on the part of local government to give up what they once had. They had controlled the whole show under CETA, and along comes JTPA—again, this is under private industry councils—and steal your common patron jobs, out here, this guy; that gal, in these various positions, they do not want to lose them overnight.

Mr. **Walgren**. I can only speculate, too, and I wonder whether there might be something in the difference in the depth of the unemployment problem between the areas that might have more diversified economy, versus the areas that have or had very focused economies that collapsed rather suddenly. And if there are no jobs that the private sector is in a position to contribute, then the—then their contribution is, by definition limited, and that may be part of the explanation for why the Pittsburgh area that went into such a deep depression, was unable to get picked up in that program. But I—something is causing this difference, and I would be curious to know what this difference is——

Mr. **Boehlert**. I do not want to misrepresent that the private sector is not putting up the dollars in New York, but the private sector, in—and when I talk about private sector, I, at all times, mean organized labor as part of that, because I think that is an essential ingredient, because they are providing the direction, they are making the decisions, based upon their projected needs, rather than some bureaucrat sitting in a county office, and I used to be one of them, I was a county executive—well, I thank you very much, Mr. Hines, and Ms. Wilson, for excellent testimony. It was very helpful to me.

Mr. **Walgren**. Thank you, very much. The next panel is made up of Edward Slack. Welcome, Mr. Slack. Glad you could join us. Mr. Slack is the president of Pittsburgh Plate Glass Industries; PPG Industries, locally. And you ought to see our skylight, by the way. If Mr. Slack would come forward, and Harold Hall, who is the president of Hall Industries, and is here, also, as the, I believe, they call them presidents of the Small Manufacturing Council of Allegheny County, in western Pennsylvania; John Smith, who is an assistant to the International Steelworkers of America. Gentlemen, welcome to our discussions.

We appreciate your making time in your commitments to join us. Let me say, again, at the outset, that written submissions can be incorporated, verbatum, in the record that we develop, and please feel free to outline or underline the points that you feel really deserve to be hit. So, with that, let's start with Mr. Slack, and again, I will try to remember to identify each of you as we go down the line, at the start of your testimony, so that the court recording represents who it is. Mr. Slack?

STATEMENT OF EDWARD J. SLACK, PRESIDENT, PPG INDUSTRIES, PITTSBURGH, PA

Mr. **Slack**. Thank you very much, Congressman. I would like to, first of all, point out that back in 1967, we began changing the name from Pittsburgh Plate Glass to PPG Industries. I am glad that you remembered. We are PPG Industries.

Mr. **Walgren**. I am older than most would guess.

Mr. **Slack**. Congressman Walgren, Congressman Boehlert, ladies and gentlemen, my name is Edward J. Slack. For the past year I have served as president and chief operating officer of PPG Industries, where I began working in 1946 at our glass plant in Creighton, PA.

As president, my work involves general responsibility for our worldwide business operation, which are concentrated in the glass, chemicals and coatings industries. Altogether, PPG's work force totals 38,000; of whom approximately 27,000 are based in the United States.

Although the businesses that PPG is in today do not appear on the standard lists of high-technology industries, our company has pioneered in the use of innovative technology. We expect this use of sophisticated manufacturing and office systems to continue growing, wherever it can be justified in terms of productivity. I want to, through the course of the discussions, emphasize the importance of productivity. We place a high value on seeing that PPG people at every level become proficient in the use of new technology, and we have various programs in place to support that objective. So, I appreciate being invited to appear here, today, and for the opportunity to speak about training for advanced technologies. What I would like to do today in particular is to address some of the issues related to technical training, which are of special concern to those of us in the manufacturing sector.

That could be useful, since the goal of the legislation before us today is to help technically trained people become employed in the private sector. So, with that in mind, I would like to discuss the training issue in the context of three long-term trends, which are reshaping America's manufacturing environment.

Undoubtedly, the single most important development in manufacturing has been the gradual rise in productivity, as measured by the value produced per employee, and that has occurred over most of this century. Productivity improvements have historically been linked to the use of new equipment. They have enabled manufacturers to produce more goods with fewer employees, and to do it at lower cost than ever before. More than any other factor, productivity improvements have been responsible for the rising standard of living that most Americans have enjoyed this century, and I expect to see that trend continue. I anticipate more use being made of advanced manufacturing technology, fewer people working on the shop floor, and more value produced by each employee in the future than today.

Another development which has sharply affected America's industrial climate has been the tremendous growth of competition from abroad. The nations of the Pacific Rim, in particular, have increased their manufacturing capacity, as well as the sophistication of their products, so rapidly, that today Hong Kong, Taiwan, and Singapore, together, account for more exports to the United States than all the nations of Western Europe combined. That does not count Japan or Korea.

The effects of heightened competition from overseas on U.S. manufacturers have been dramatic. For example, we are under unprecedented pressure to hold business costs down, and increase our operating efficiency. Industrial wages are gradually adjusting to world market conditions. More and more manufacturing is being shifted offshore. Not everyone will survive that transition. Already, whole U.S. industries have succumbed to the pressure.

We also expect to see this trend continue. But we anticipate that at least a few of its consequences will be favorable for U.S. industry. Specifically, there will be new manufacturing efficiencies developed in response to this pressure. That should result in lower cost, more competitive U.S. products, both here and abroad. American companies will be forced to become more globally oriented, and emphasize products with world wide appeal, instead of producing for the domestic market alone. Innovative manufacturing techniques developed in other countries will be examined more carefully, and some will be adopted here. It is clearly a mixed bag, but we expect the heat to stay on American industry, and for industry to respond.

The third general trend affecting U.S. manufacturing is that the overall North American economy is no longer growing at the rate we experienced in the past. Back to an earlier comment that you made early on, things have not gotten much better. It is not business as usual. Things are tougher, they are more difficult. The things that I am talking about emphasize that very point. That means we can look forward to a tougher, more competitive environment at home, and a greater commitment to overseas expansion as well. In a number of America's commodity-oriented industries, there is significant overcapacity right now. It will be quite some time before demand catches up with supply, in such basic materials as steel, chemicals, agriculture, and energy products, and I happen to know well about chemicals and agricultural products.

As I read it, the significance of these three trends is that there will be fewer, rather than more, employees involved in manufacture. And, for the most part, those doing it will be the employees already there. In other words, it seems more likely that upgrading the skills of current employees, rather than hiring new ones with specialized training, will be the preferred approach to obtaining new technical skills.

What this suggests to me is that technical training programs might be looked at more as a method for preventing unemployment tomorrow, than as a technique for reducing unemployment today. It means thinking about the goal of technical training as extending the trainee's current expertise, instead of creating brand new careers for them. In many cases, what we are looking at are new tools for doing today's jobs better, rather than entirely new jobs. So, training people who are already familiar with the work being done, makes a lot of sense. I should also mention that most of the new employees PPG hires these days are college graduates. We rarely hire technicians or new employees with associate degrees any more.

We must be careful not to lose sight of the fact that what drives the creation of new jobs in industry is not the availability of people, however skilled they might be. What generates jobs is the prospect of producing a product or a service for a profit. And enhancing that prospect involves a whole range of factors that we know collectively as a business climate. A technically skilled work force is certainly an important element of that climate, but without the necessary marketing, financial, distribution, legal and technical resources, no business can succeed.

However, I would like to point out that several nontechnical skills are also of growing importance to industry—skills which would strenghten today's industry, as well as tommorrow's. Such interpersonal skills as teamwork, communication and leadership, have become increasingly important throughout American industry. That is because today, more and more productivity improvements originate from the shop floor. These are the skills needed to bring them forward. International skills, including fluency in foreign languages, understanding other cultural systems, and the ability to operate effectively abroad have also become more valuable in today's global business environment than ever before.

And finally, the skills involved in entrepreneurship, which include basic marketing, financial, administrative and technolog—technical skills, are in short supply locally, compared to some parts of the country, and we need to cultivate them here, as well.

I recognize, as you do, that we live in a pluralistic society. There is ample room for different approaches to upgrading our region's human capital. As I see it, the training bill you Congressmen are proposing, fills a gap in this area's human development resources, and we support it.

In conclusion, then, I would like to list what I feel are some of the key points to bear in mind for any program of this sort:

First, technology is evolving at a very fast pace. It is difficult to foresee where any single technology will be, even 5 years from now. The rapid obsolescence of technical skills is a reality, and it is important to avoid overselling the long-term career value of any one technology.

Second, some people are better able to absorb technical training than others. There are background, ability, and motivational factors which should be taken into account before enrolling anyone in a program.

Third, today's fastest growing areas of employment involve services rather than manufacturing. It seems reasonable to prepare people with the skills needed for those sectors of the economy where jobs are growing, rather than for those which are in decline.

Finally, it disturbs me a great deal that throughout this Nation, the high school dropout rate is continuing to creep upward. It is now approaching 25 percent. And yet, the need today is greater than ever for such fundamental skills as computation, communication, and analysis throughout our work force. Japan, Russia, and several other industrial nations have moved way ahead of us in providing these skills, as well as more advanced ones, to their people. In today's demanding business environment, America simply cannot affort the added burden of a large and permanent underclass—one which lacks even the most fundamental learning skills. I recognize that this issue is separate from the technical training bill we are discussing today, but I think that any effort directed toward resolving this issue would also be time well spent.

Thank you, gentlemen, very much for this opportunity to testify.

[The prepared statement of Mr. Slack follows:]

Edward J. Slack testimony
Advanced Technical Training legislation
September 30, 1985
Pittsburgh, PA

Congressman Walgren, Congressman Boehlert, ladies and gentlemen. My name is Edward J. Slack. For the past year, I have served as President and Chief Operating Officer of PPG Industries, where I began working in 1946 at our glass plant in Creighton, Pennsylvania.

As President, my work involves general responsibility for our worldwide business operations, which are concentrated in the glass, chemicals and coatings industries. Altogether, PPG's workforce totals 38,000, of whom approximately 27,000 are based in the United States.

Although the businesses that PPG is in today do not appear on the standard lists of high-tech industries, our company has pioneered in the use of innovative technologies. We expect this use of sophisticated manufacturing and office systems to continue growing wherever it can be justified in terms of productivity. We place a high value on seeing that PPG people at every level become proficient in the use of these new technologies. And we have various programs in place to support that objective.

So I appreciate being invited to appear here today and for the opportunity to speak about training for advanced technologies. What I would like to do today in particular, is to address some of the issues related to technical training which are of special concern to those of us in the manufacturing sector. That could be useful since the goal of the legislation before us today is to help technically-trained people become employed in the private sector. So with that in mind, I'd like to discuss the training issue in the context of three long-term trends which are reshaping America's manufacturing environment.

Undoubtedly the single most important development in manufacturing has been the gradual rise in productivity -- as measured by the value produced per employee -- which has occurred over most of this century. Productivity improvements have historically been linked to the use of new equipment. They have enabled manufacturers to produce more goods with fewer employees and to do it at lower cost than ever before. More than any other factor, productivity improvements have been responsible for the rising standard of living that most Americans have enjoyed this century.

I expect to see that trend continue. I anticipate more use being made of advanced manufacturing technologies, fewer people working on the shop floor, and more value produced by each employee in the future than today.

Another development which has sharply affected America's industrial climate has been the tremendous growth of competition from abroad. The nations of the Pacific Rim, in particular, have increased their manufacturing capacity as well as the sophistication of their products so rapidly that today, Hong Kong, Taiwan and Singapore together account for more exports to the United States than all the nations of Western Europe combined. And that doesn't even count Japan or Korea.

The effects of heightened competition from overseas on U.S. manufacturers have been dramatic. For example, we are under unprecedented pressure to hold business costs down and to increase our operating efficiency; industrial wages are gradually adjusting to world market conditions; more and more manufacturing is being shifted offshore. Not everyone will survive that transition. Already, whole U.S. industries have succumbed to the pressure.

We also expect to see this trend continue. But we anticipate that at least a few of its consequences will be favorable for U.S. industry. Specifically, there will be new manufacturing efficiencies developed in response to this pressure. That should result in lower-cost, more competitive U.S. products, both here and abroad. American companies will be forced to become more globally-oriented and to emphasize products with worldwide appeal instead of producing for the domestic market alone. Innovative manufacturing techniques developed in other countries will be examined more carefully, and some will be adopted here. It's clearly a mixed bag, but we expect the heat to stay on American industry and for industry to respond.

The third general trend affecting U.S. manufacturing is that the overall North American economy is no longer growing at the rate we experienced in the past. That means we can look forward to a tougher, more competitive environment at home, and a greater commitment to overseas expansion as well. In a number of America's commodity-oriented industries, there is significant overcapacity right now. It will be quite some time before demand catches up with supply in such basic materials as steel, chemicals, agricultural and energy products.

As I read it, the significance of these three trends is that there will be fewer, rather than more, employees involved in manufacturing. And for the most part, those doing it will be the employees already there. In other words, it seems more likely that upgrading the skills of current employees, rather than hiring new ones with specialized training, will be the preferred approach to obtaining new technical skills.

What this suggests to me is that technical training programs might be looked at more as a method for preventing unemployment tomorrow than as a technique for reducing unemployment today. It means thinking about the goal of technical training as extending the trainee's current expertise instead of creating brand-new careers for them. In many cases, what we're looking at are new tools for doing today's jobs better, rather than entirely new jobs. So training people who are already familiar with the work being done makes a lot of sense. I should also mention that most of the new employees PPG hires these days are college graduates. We rarely hire technicians or new employees with Associate degrees anymore.

We must be careful not to lose sight of the fact that what drives the creation of new jobs in industry is not the availability of people, however skilled they might be. What generates jobs is the prospect of producing a product or service for a profit. And enhancing that prospect involves the whole range of factors that we know collectively as the 'business climate'. A technically skilled workforce is certainly an important element of that climate. But without the necessary marketing, financial, distribution, legal and technical resources, no business can succeed.

However, I'd like to point out that several non-technical skills are also of growing importance to industry -- skills which would strengthen today's industries as well as tomorrow's. Such interpersonal skills as teamwork, communication and leadership have become increasingly important throughout American industry. That's because today, more and more productivity improvements originate from the shop floor. These are the skills needed to bring them forward. International skills, including fluency in foreign languages, understanding other cultural systems, and the ability to operate effectively abroad have also become more valuable in today's global business environment than ever before.

And finally, the skills involved in entrepreneurship, which include basic marketing, financial, administrative and technical skills, are in short supply locally compared to some other parts of the country. We need to cultivate them here as well.

I recognize, as you do, that we live in a pluralistic society. There is ample room for different approaches to upgrading our region's human capital. As I see it, the training bill you Congressmen are proposing fills a gap in this area's human development resources, and we support it.

In conclusion, then, I'd like to list what I feel are some of the key points to bear in mind for any program of this sort:

First, technology is evolving at a very fast pace. It is difficult to forsee where any single technology will be even five years from now. The rapid obsolescence of technical skills is a reality, and it's important to avoid over-selling the long-term career value of any one technology.

Second, some people are better able to absorb technical training than others. There are background, ability and motivational factors which should be taken into account before enrolling anyone in a program.

Third, today's fastest-growing areas of employment involve services rather than manufacturing. It seems reasonable to prepare people with the skills needed for those sectors of the economy where jobs are growing rather than for those which are in decline.

Finally, it disturbs me a great deal that throughout this nation, the high school dropout rate is continuing to creep upward. It is now approaching 25 percent. And yet the need today is greater than ever for such fundamental skills as computation, communication and analysis throughout our workforce. Japan, Russia and several other industrial nations have moved way ahead of us in providing these skills, as well as more advanced ones, to their people. In today's demanding business environment, America simply can't afford the added burden of a large and permanent underclass - one which lacks even the most fundamental learning skills. I recognize that this issue is separate from the technical training bill we're discussing today. But I think that any effort directed toward resolving this issue would also be time well spent.

Thank you once again for this opportunity to testify.

Mr. **Walgren**. Thank you for that testimony, Mr. Slack, and, more particularly, of the comparison of training in the face of high school skills between the our country and other of our competitors is very sobering, and to the degree that previous witnesses testified to the general applicability of these training skills and their success, I think procuring immediate reemployment at that point should not be lost on those, and there is a lot that can be realized when focusing on that, even though it is not purely technician training. So, thank you for that testimony.

Let me turn to my friend, Mr. Hall. I have not gotten to talk to him yet this morning. I apologize for having a need to take a message outside, but let me recognize Mr. Hall, please go ahead, and I will be right back.

STATEMENT OF HAROLD HALL, PRESIDENT, HALL INDUSTRIES, INC., PITTSBURGH, PA

Mr. **Hall**. Thank you, Mr. Walgren. I appreciate the opportunity to share my views with you, ladies and gentlemen. I am Harold Hall, I am the owner of Hall Industries in the Pittsburgh area. We operate six plants. Most of our work is subcontracted to larger companies in our area, including Mr. Slack's PPG. I am also chairman of the Small Manufacturer's Council of Western Pennsylvania, which is a group of some 2,100-plus small businesses, and we are struggling in the Pittsburgh area, in western Pennsylvania, to meet the changing business climate that we have. I would like to hold that it is not an accident that Massachusetts and California have the—a predominant amount of the defense contracting in this country. They have, for over 40 years, both States, afforded their populations with very, very little cost or no cost education past the high school level, to the level that their people can absorb.

I would like to just take a look at the Pittsburgh area, and note that within the last 5 years, Pittsburgh was the third largest concentration of Ph.D.'s in industrial arts—that is in science and technology. We have 17 major research laboratories in the Pittsburgh area. In the shadow of the large industrial production, that may not have been so apparent, but we are watching that with the industrial contraction, we are watching the demise of that basic technology. Within the last several months, we have watched United States Steel's activity in Monroeville closing. We have watched Gulf Oil turning their research laboratory in Harmmerville into part of the University of Pittsburgh, and that is a great asset we have left to us. We may have to look to history for a little bit of a lesson here. The United States could be entering the dark ages of industrial and technology activity, as we are being challenged by the offshore competitors in these areas.

The community college system may not like the idea of the identity of becoming a monastary. They may be well-advised to think about themselves as a repository for the technical and industrial knowledge and experience, which we now have. It may well be that there will be the best place where we can conserve what experience and knowledge we have, and continue a quiet development, so that we are not totally lost in the world of emerging technology. I would recommend they give some thought to that. We have, in the Pittsburgh area, and I am sure this is true in the country—we, today, have the best technology in the world, and if we allow it to go dormant, we are going to be the losers. And I, again, point out that I think this is a very good activity, for the community college system, across the country, to pick up the challenge to keep us current.

I am certain that the more I read of the House Resolution 2353, it appears to be addressing our problem. It not only gives an opportunity for the students to have this education, but it provides a forum for the persons in our country to continue practicing and developing the industrial arts, and I would surely hope that this can come to be.

I thank you very, very much for this opportunity.

Mr. **Walgren**. Thank you, Mr. Hall. Mr. Smith, would you proceed, then we will have questions at the conclusion of your testimony.

STATEMENT OF JOHN T. SMITH, ASSISTANT TO THE INTERNATIONAL PRESIDENT, UNITED STEELWORKERS OF AMERICA

Mr. **Smith**. Thank you very much, Mr. Chairman. My name is John T. Smith. I am the assistant to the international president of the United Steelworkers. Our international union is headquartered here in Pittsburgh, PA, the president is Lynn R. Williams.

I bring you the greetings of our union, and its over 1 million members.

It is our best wishes that the legislation, as is being proposed in House Resolution 2355, that this essential legislation would be enacted, in order to deal with some of the massive problems that we have, in terms of the transference of skills, the upgrading of skills, that will be necessary for those who have been traumatized by the permanent separation from employment, in the basic steel industry if they are to have a fighting chance in the competitive job market, and the shrinking job market, I would point out, in the industrial sectors of our country.

We have witnessed, since 1977, as an international union, a loss of membership, basically attributed to the loss of members that were in the basic steel industry. I repeat, in 1977, of 1.4 million members, from 1977 until 1985, we have witnessed that membership, being cut in half by layoffs due to plant closings. I keep referring to the membership, because the basic thrust of the trade union movement's strength at the collective bargaining table; relate to membership. Obviously, we take the position of the dislocated workers—steelworkers, if you will as being a concern that we have as we look at the general welfare of the community, and the Nation, as a whole.

We have lost, in the basic steel industry, in excess of 400,000 jobs. Those 400,000 jobs were lost primarily, because of the changing technologies, but also, having an equal impact in terms of the cause of that loss, has been the importation of steel, which amounts to the exportation of jobs. The new technologies that have been developed in the basic steel industry; actually starting back with the process of the basic oxygen furnace system, in the late fifties and early sixties have contributed to greater productivity, but has had a corresponding effect in terms of the loss of jobs in the manufacturing industry. Obviously, we are aware that for the steel industry to be competitive, it must purchase the best technology possible, and provide to the workers the best technological tools possible to produce the steel at a productive rate to make them competitive in the world market. But we would submit to you, Mr. Chairman, that the other reasons that accompany this circumstance that has been visited upon thousands of our members have been that of the failure of public policy to deal with this depression not just by pursuing the proposition of free trade, but also the need for fair trade.

I do not want to get into a political statement in this area, but I think the record speaks for itself. Here in the Pittsburgh area, we have lost some 50,000 people out of the basic steel and allied industries. We believe that we have served, in this community, along with the private industry councils—whose representatives spoke a while ago—the type of relationship that, since the start of the loss of jobs in the basic steel industry, that was occasioned by the circumstances I aforementioned, to the extent that we have taken advantages—full advantage—to the extent that we can. All of those federally funded programs that would provide for a basic training vehicle being established in the communities that has been devastated for dislocated workers.

Our close cooperation with the private industry councils can be found to be valid as—right now in operation, jointly pursued by labor and management, some three dislocated worker assistance centers, that provide for a comprehensive program of training, as contemplated under the Job Training Partnership Act of 1982. As such, the training vehicles are located at the Duquesne Center, in Duquesne, PA, and Aliquippa, PA, and likewise, at Midland, PA. The Duquesne Center, a JTPA funded project, was pursued jointly by management and labor, as a result of our collective bargaining relationship, and the establishing of language in the collective bargaining agreement, in March 1983, which recognized the continued proliferation of circumstances related to plant shut-owns. That has brought all of those things that are attendant, with the trauma of unemployment. But an aggravated condition still exists among steelworkers that I would like to relate to this committee, in response, perhaps, to Congressman Boehlert's inquiry as to the differential between the degree of participation in New York State and perhaps what exists here in Allegheny County.

The matter of plant shutdowns is one that is within the sole purview of management, as to when a permanent shutdown will be determined, or announced. And, obviously, that might represent a business necessity, and we recognize this. For one to guess about when a plant is going to shut down, or if you advertise when one is going to shut down, it does a lot of things to those people who have an interest in Wall Street and the Dow Jones average. We understand that.

It has caused a problem, however, which broght about a lag time, in terms of dealing with the some 50,000 dislocated steel workers in this area—a lag in their making themselves available to the training that is contemplated under the Job Training Partnership Act by the establishment of the programs just described.

That lag was a result of, as indicated here by the previous witness, Ms. Wilson, a former employee of United States Steel—she had her last unemployment check coming before she got engaged in a training program. I would submit to you that she reacted like about 70 percent of the 400,000 people displaced in the basic steel industry, that did not take advantage of Job Training Partnership Act programs, because of the fact that they had no income maintenance at the point that those permanent shutdowns were announced. That is to say that 60 percent of all of our people that came out of the basic steel industry, and 10 percent of the allied industries—we are talking about the manufacturing units—were laid off over 2 to 3 years before any permanent announcement was made that the plant was going to shut down. The Job Training Partnership Act contemplated that those who were off 2 years or less would become immediately involved in training programs at the announcement or the knowledge that they were going to be permanently unemployed.

I describe this to you to point out that, essentially, those who were laid off at the, for instance, from steel facilities here at United States Steel, J&L, Bethlehem Steel—the announcements that permanent shutdowns of those facilities were going to take place, did not take place until they had exhausted all of their unemployment benefits. They had no income maintenance factors that they could deal with, and many of them were led to believe that to participate in Job Training Partnership Act programs, because of the bureaucracy, not being as informative at the employment service level that they might be, to the extent that they would advise that to be engaged in a training program will deny you unemployment compensation.

We know that this was a farce. A document was prepared by the DOL, and sent out, immediately to the States, and this was brought to their attention, that those who were engaging in the Job Training Partnership Act programs could, indeed, continue to draw State benefits, if those States received and used Job Training Partnership Act money. I point that out to indicate that this became a major problem to, not just the union, but the companies, also, in our pursuit of training programs.

The attempt, as we analyze it, in House Resolution 2353, Mr. Chairman, we believe, will go a long way to bring about the needed vehicles that will help both management and labor in developing the wherewithal to cope with the technological changes that have taken place in the basic steel industry.

That is where we bring on the scene continuous casting operations of a highly technical nature, and also those that are presently in existence, as it relates to our finishing mills, the electrolytic tin mills, and the high-speed seamless tube mill operations—all of those require skills that is beyond that that is normally produced through the training vehicles that are presently in operation in the basic steel industry. Those training vehicles that are present in operation—I would point out, are training vehicles that in the main, by contractual arrangement and practice, have been a training cost basically, one that was absorbed by the management. That is to say that when training was needed—the progressional ladders that were established by agreement where one promotes and regresses to during force reduction, had in it inherently, a basis for one to be trained for the job that he would next compete for in that line of progression.

That is to say, that when day-to-day vacancies occurred in the higher-level jobs, the person below in the lower-level job, had rights to fill in on those day-to-day vacancies, and they received reasonable amounts of instruction as to how to carry those jobs out. The problem, now, as it emerges, as far as high technology is concerned, and the use of computerized operations—the need to be well-versed, and the ability to be able to look at a screen and be able to adjust by using the type of technology, that is, computer technology—we have found that it is absolutely essential this type of legislation that is being proposed here be made a part of the national agenda, if, indeed, this country is to maintain the level of industrial might that it should have, while we watch industries leave, the high technology that is being applied in the basic steel industry, obviously cannot produce the type of training that is necessary to provide, not only a basis to secure domestic tranquility, but will likewise provide for the common defense of this country.

We would say that this, in conjunction with programs already in effect, should be the basic rationale for pursuing the enactment of this legislation. That is to say that the Job Training Partnership Act is crucial—it is crucial that these programs remain in place, just as well as the Trade Adjustment Assistance programs that are presently provided for where employees are impacted because of foreign trade.

I would point out to you that we believe that all of the things that are being done in the basic steel industry, and the manner of technological changes, Mr. Chairman, in lieu of me coming here today, on behalf of our union, to testify here and bringing you a document that would reflect our analyzation of the problem, and how new technology is impacting on the jobs that formerly existed in the steel industry.

We would submit that if this committee would relate to its document—that is the one that the Congressional Research Service for the Library of Congress, was commissioned and requested to prepare for the House Committee on Science and Technology, and the Subcommittee on Science, Research and Technology, that was prepared by Ms. Linda LaGrange, and compiled—and published on July 10, 1985—some 33 pages, entitled "Employment in the Steel Industry and the Shaping of Changes"—that if the committee was to read all that has been published in that report—and I am sure that most of the members of the committee have done so—we as the union could not enlarge upon those things. We would say to you that this document is the most accurate and appropriate view of what is currently developing in the steel industry. How the new technology jobs are emerging, and how those that have come—have been commonplace in the industry are disappearing, and what can be projected, prospectively into 1980's—1995, has been adequately described in every detail.

We are glad that the information sources that we use—the regulatory agencies in Government are the same agencies that we have to report to—that is, the same agencies that the Iron and Steel Institute has to report to—the Department of Labor and the Department of Commerce—all of these reports are submitted to them, and we find them, as source information, in this document, which was prepared for this committee, to take a specific look at the steel industry has adequately described the current circumstances. And we would recommend that the committee look at it as a view as representative of both company and management, except for some of the inferences that might be enclosed—one such inference, specifically on page 22, would tend to indicate that it might be more advantageous for the management to go out, and instead of training those who are still on the job, to meet the new technology challenge, to go out and just hire them directly off the street—I would say that that leaves a lot to the imagination and flies destructively in the face of the collective bargaining arrangement between our union and the steel companies.

But other than that, the complete 33-page report as extended to this committee, represents that type of analyzation that would have been made, if our union were to have compiled such a report, as far as new technology is concerned. At the headquarters, one of my responsibilities as assistant to the president is to chair the task force on dislocated worker program development. We have, since 1983, revitalized our union's effort to do this. What we have put in place is a mechanism that, is effective in the collective bargaining agreements, whereby the parties jointly are pursuing these projects. We are not selfish in nature, but the fact is that all of the projects that we have joined to pursue are steel-specific. That is to say, they are not programs that are open to the general public, as it relates to the unemployed. These are projects that the seed money, or the matching money required from the State JTPA and the DOL—those matching moneys have been negotiated through discussions as collective bargaining entitites. We have two different routes that have been traveled. One of those routes was the terms of the collective bargaining agreement—to get the parties to recognize the problem, and to set aside cents per man-hours worked, to deal with the match in that situation.

The other was that in 1983, when we negotiated what we believe, in the wisdom of the collective bargaining parties, particularly as far as our union was concerned, a responsible agreement. The agreement provided for some $4 billion of concessions, in order to see the steel industry survive, and have the net cash flow that they needed at that particular time, to have a fighting chance. The recent announcement here that there will be additional closings, would be representative of the fact that such conditions were not enough to get the job done. However, we believe that the initiative has been taken, as far as our membership is concerned, and the response from the management of the basic steel industry in this area, after it had recognized that there was no way—no way to stop the restructuring of this industry, because such restructuring was coming about—caused by circumstances in the world market, the Nation's economic climate, foreign imports, new technologies—all of these factors being a part of the problem. There was but one thing to do, and that was to try to devise a means to save as much of the steel industry as we possibly could. We are still dedicated to that particular cause. We would hope that the Government and the representatives of Government, would continue to support an effort to enhance the skills of those who have been displaced permanently. We believe that this bill will go a long way in doing that.

We are aware, and I am sure that the community college representatives that spoke here this morning recognize that there are numerous steel workers participating in the dislocated workers programs at community colleges, and, in fact, the programs that we have developed jointly. The placement factors, for training as needed, is subcontracted to community colleges to get that job done. We would hope that this bill would not supplant, but would supplement the continued process in the area of trying to redirect the lives of those who have been affected and visited by the trauma of unemployment.

Thank you very much, Mr. Chairman.

Mr. **Walgren**. Thank you very much, Mr. Smith. We appreciate that testimony, and I am always struck by the rapidity of the decline in the steel industry in these last several years, and by the fact that there had been, throughout the last 20 years, certainly, a substantial amount of modernization in the production processes of the steel industry, even though they are always quick to characterize it as an industry that did not modernize. It is my understanding that we were producing the same amount of steel in the late 1970's, let's say, as we were in the midfifties, but with only half the work force. That means that over those 20 years, the productivity increases were substantial. If we could do the same amount of work with half the amount of workers, obviously you have made some progress. So, instead of an industry that can be characterized as not having modernized, I do think that that sharpens your attentions on whatever the forces of the last several years have been in contributing to the real rapid increase in the decline. That gives us a problem that focuses on some people who are displaced very quickly and very dramatically, as opposed to those, who in more normal times, we could be training to provide a mechanism to get that——

Mr. **Smith**. Mr. Chairman, it, in my opinion, is quite evident that there will be a permanent increase of new technology in the steel industry. It is further evident that the continuous casting type operation, high technology required, and also the basic oxygen furnace process, which, I'd say in the late sixties, was innovative and also contributed fairly to increasing productivity. And in this area, in the Mon Valley, and the area where your constituents are, that modern technology had not been put in place. It is not in place now. It would appear, that from our own viewpoint, that it would not be put in place unless there would be a complete turnaround in terms of the steel market, as it relates to our ability to export steel from this country, and the cutting down from the 27 percent of our domestic consumption being imported.

Mr. **Walgren**. Let me ask Mr. Slack. Of the striking things you indicated, Mr. Slack, the trend would be for industries to be, retraining their own workers, rather than looking for new workers, and that the direct manufacturing base, in any event, is going to continue to slacken its productivity as it comes on and continues to increase output. This would seem, on the surface of it to, on one hand say, well, if that is where all the returning is going to be, it can be left to private industry, because it is certainly of a very direct incentive to engage in that. But it could also, in the basis of saying that private industry has a real interest to contribute and join in the retraining processes, inasmuch as it expects to be—to have their own workers taking advantage of this in their own company, at that point, being a direct beneficiary.

Could you react to that?

Mr. SLACK. Yes. I would be very happy. I think everything that was said is of concern. Certainly, and I am speaking for PPG, specifically, we are very much aware and very much concerned about the trend that is taking place—the trend that you referred to. I think the other thing that we recognize—and this is very important to us—is that we are in a world market. We are not in a domestic market. We are in a world market, and we are being—we are—we have to be competitors with the world, whoever they are, whether we are in the steel industry, or we are in glass or chemicals, or whatever we are in, the world has gotten smaller as far as competition is concerned—there are going to be very few—and that holds particularly true for commodity products, steel being one of them, chemicals, which I am very familiar with, being another. Then we see what happens. And, being concerned, we have initiated, as I indicated in the prepared comments that I had, we had our own internal program. We think that we can handle some of our own basic needs, but we have a need for programs that are of the type that are represented by the legislation that is being proposed, to work in concert with community colleges, or whichever services are going to be available to us. So, I think it is a combination of the private and government, through the community colleges, or whoever, that is going to help to resolve some of the problems.

The other part of the legislation that I think is directed toward—it is going to be very helpful is, as I have indicated it, the fact that even though there is going to be a reduction of the number of jobs on the shop floor, so to speak, there is going to be an increase in the number of service jobs. Those same skills, and we are talking about the leading—Mr. Smith, identified in some of the comments that he made—I think are also going to be required in the service industry. I am talking about the basic mechanical skills, some knowledge of some of the basic physics technologies, science, electronics, and so on, that really will be quite helpful in the service industry.

I hate to keep talking about this, but this is a very serious concern, though. What happens, in order to be competitive in the world, and to have a strong company, that continues to provide employment for its people—what happens if those growth opportunities that manufacturing facilities can no longer provide? So, you know, there has to be a solution to that problem. I cannot say I have a solution to it, I wish I did. But, we are searching, we are looking for, and I think that what is being proposed would be part of the answer to it.

Mr. WALGREN. In both your own internal training programs, and, Mr. Smith, in the steel worker training program, is there any question that a worker whose job is eliminated by an advance of some kind would be satisfactorily retooled, within your company? Are there instances here where you say that there are new opportunities within your company, but that the workers that you are having to displace, or may be displaced, by changes and things, are simply not the ones that you want for those other opportunities?

Mr. SLACK. I think that that also goes back to some of my prior remarks, and that is the inherent abilities of people, and that differs. And so, I think that partly, internal programs that we have, they are effective up to a certain point, but they are not totally effective, and there are many people who just do not have the skills that are going to be required for the computerization—there are some steps that are referred to in the steel industry that we see happening in our own particular areas. There are people who do not have enough skills, and some of them are going to be displaced.

Mr. SMITH. I think that, Mr. Chairman, that I should put this matter in proper context, that perhaps—it is not really as simple as one might think it is, and that perhaps will give more meaning to what I said a while ago, and that was the career ladder type concept, and the rights of employees to use their continuous service, or seniority, to be retained and promoted to such jobs.

That is not an absolute process. Inherent in that process is, as indicated by Mr. Slack, you must have some inherent ability to be able to absorb training, No. 1. It is not just a simple matter that you are entitled. Your entitlement will not get you the job alone. Your physical fitness and your relative ability to perform the job must be relatively equal in order for your seniority to take place. That is to say that there will be some that will not, Mr. Chairman, be able to cut the mustard, in terms of moving to the higher tech, or the computerized-type operation, from that which would, normally, be a process in the primary mills that they used to operate in this country, so there is, again—even the programs that are administered by the companies to enhance the skills of those, sharpen up the skills of those—it would require community colleges, in order to deal with that particular thing, because that is not the type of training vehicle that is set up in classrooms, at plant levels, in order for them to get the type of skills that would be needed.

Again, I would say that is the reason why our focusing attention, with respect to this proposed legislation, which you want, and we believe is conducive to changing that atmosphere or circumstance that I have described.

Mr. BOEHLERT. Mr. Chairman, will you yield for a moment, please.

Mr. WALGREN. Congressman Boehlert.

Mr. BOEHLERT. If I may make an observation, since all three of you endorse this concept, I will go a little bit farther afield, if I might, for a moment. Part of the problem, I think, is national policy. We encourage, through our tax credits, your company to invest in new plant equipment, in customer tax credit. I would say you probably gave them some advice to keep that high scope, and yet on some of your capital recovery system, you probably wanted to keep that, too. Both of those are designed to encourage companies like PPG to come up with new equipment, new plans, and in many instances, new plans for displaced workers. But we do not give you any incentive to invest in human capital. And I think we had better do a better job with our Tax Code to encourage PPG to spend more money training the very people that are going to be displaced, so they can be the ones that go in and take these other jobs that are coming aboard. I am like Mr. Smith. I am offended by that comment on page 22. That is a fact of life, that report, that it is easier for PPG to go and hire off the street—it is less costly for you than it is to retrain one of your workers. So, that is kind of our challenge in Congress, is to come up with some incentives for the private sector, business persons, to invest in human capital, as well as plant machines.

Mr. **Slack**. I do not think you can legislate it, personally, but we have to have a feeling for what has happened. I am talking about a healing for the people who are displaced. We have to find a solution to that problem. You said it, and in fact, I think I am going to quote you, verbatim, that when the Government gets involved, we usually have a way of screwing up a good program, and that is why I do not think we can legislate everything. I think what we really have to be concerned about is what do we do with those people who are going to be displaced? That is my personal concern. I think that what we need to do is to figure out, how can we—whatever it is that is legislated, or enacted, or we are going to do, is going to be done in a most productive way. How do we get the best results? Will it be the National Science Foundation who handles the implementation of this legislation that is going to be enacted, or whether it would be the Department of Education, I think it is important that the $20 million that is going to be allocated is spent in a most effective way. And then, I think, what will we get—you say we will be getting more bang for our buck in whatever it is that we do.

Mr. **Walgren**. Let me ask you this, Mr. Slack. Your planners, and I am sure you know the great key consultants, and an able professional staff, can look 5 years from now and can come into the confines of your office and say to you, 5 years from now, that these operations will no longer be needed. You know how many people are employed in these operations, that if we do the job that we should be doing in Washington, to give you some incentive to expand your in-house training, you could then start training these people for the eventuality of being displaced by the changing technology, so that they would go from one job, which is no longer needed, to another job, and not have that interim period when, like Ms. Wilson, they are unemployed for 2 years.

Mr. **Slack**. There is no question in my mind—and first of all, I want to thank you for this compliment of our planners being able to look at 5 years. They are no better than any of the rest of us. The only thing that they are able to do, and we are able to do, is to determine trends, not specifics. If I had acted on some of the information that I had four years ago, I would have gotten out of some of the businesses that are most profitable for us today.

Mr. **Walgren**. Are you using soda ash, for example?

Mr. **Slack**. No.

Mr. **Walgren**. No longer?

Mr. **Slack**. No. We have used a lot of it, which is a natural product.

Mr. **Walgren**. Which meant that the handwriting was on the wall in terms of——

Mr. **Slack**. In terms of the chemical processes for manufacturing them were getting too costly, and they found natural deposits in

Wyoming and various other places, so that soda ash is a very important ingredient to the glass industry——

Mr. **Walgren**. Well, that provides my example. That illustrates my point. Your planners could see—look, Mr. Slack, we have got to get out of this business. It is a losing proposition, and we are not going to get out of it tomorrow, it is going to be a gradual phaseout. Then you know how many employees are involved in the production of soda ash, and then if you have the proper in-house operation with organized labor you could, if they give you incentives to invest in human factors like we give you incentives to invest in machines, maybe you would have been encouraged to do that.

Mr. **Slack**. I agree with that——

Mr. **Boehlert**. The other thing is—Mr. Smith pointed something out, Mr. Chairman, that just boggles the imagination, but it is so true. We do not have responsibility at the Federal level. That is the State responsibility to determine eligibility for unemployment compensation—but how anyone can rationalize a system under which an unemployed person is told that in order to be paid the weekly unemployment check, that person cannot enroll in a full-time training program, because if you enroll in a full-time training program, you are not elibile for immediate employment, which is one of the prerequisites to get the unemployment check. How dumb that is, in terms of policy. We should be encouraging everyone on unemployment compensation to be enrolled in some program that would provide training for a job, and not deny that person the unemployment checks.

Mr. **Smith**. I think the Congress intended it to be that way—in fact, the Job Training Partnership Act is very clear, for those—the architects of it up on the Hill, who deal with its administration on a national level—this is happening at the level of—the local level, with some clerk at the employment services. It is just the basic interpretation—able and available for work interpretation. And that does not disqualify those individuals, but I say, on the directive that points that out is very clear, and I think it has come from Marvin Fook's office——

Mr. **Walgren**. Well, let me ask—inasmuch as we expect these basic manufacturing industries and the workshops that Mr. Slack is responsible for, to not be expanding, and in fact retracting, that brings me to what has been the general trend, and that is the smaller businesses and smaller concerns are aware that new hires have been, in our economy, as I understand it, for the last 10 years or more. The question is, I think, whether industries like yours, Mr. Slack, are interested in joining in making an actual contribution to a community resource that would benefit industries like those represented by Mr. Hall, who essentially, are small business trying to respond to the immediate needs, and particularly on the service side, able to gear up to provide these services. And yet, we have only, let's say, a displaced worker at this point dominating the economic climate of Allegheny County. Someone raised with me the thought that if the large corporations would set aside a part of their procurement, for local procurement, that a very small part of it, a 1 percent, or something like that, that we could literally provide the targets for smaller manufacturers to shoot at, and enable us to build some sort of a floor underneath the immediate community economics that tend to go completely downhill in a vicious cycle. So the question is, whether a company like yours can make concrete contributions to an Employment Training Program in an umbrella like Allegheny County Community College that may wind up, really, not retraining your workers, but providing Mr. Hall and his organizations with workers that can be picked up and made productive.

Mr. SLACK. I think that there are a number of ways that they can be approached. I am think of one thing we are doing now, and that is—we have a lot of internal training programs that we conduct ourselves that are specifically tailored to our own needs. We make those available to the community college, for people to come in, sit in on those training programs, which is helpful, then, for expanding those skills, beyond our own specific needs. Things like that can be done. Whenever—on a broader sense, I am sure that there will be some other things that we can do. I think it is necessary that from a cooperative point of view, a point of view that says we have a responsibility in a given area to do whatever we can to enhance the living standards or enhance the image, or whatever, in that area, that we are willing to take a look at that intent.

Mr. WALGREN. And there also, certainly, would be a real concrete interest in not having a large section of the company that you rely on to consume your products to go all the way down the chute, because if they get involved in that vicious cycle of decline, then even the successful operations are going to be pulled into that vortex and not be able to be there for the benefit of your company.

I am wondering, from a small manufacturer's standpoint, Mr. Hall, what we can see in the way of participation in these kinds of joint programs, whether the small manufacturers are able to predict their demands, or predict the skills that they will need, or is this something that we simply have to grope our way forward, in terms of training and fill only the very present foreseen needs, or whether we should have confidence in our ability to train people for the 3 year-out demand, or 5 year-out demand?

Mr. HALL. Well, I would like to call attention to the resources that the smaller companies provide the area. First of all, there has been a broad smaller manufacturers community. At one time in the Pittsburgh area, I cannot think of anything that would have been required that would not have been available by some company in the Pittsburgh area. We have not developed a nationwide market basis. We have been independent, with the larger companies as subcontractors. I will call your attention—there has been much work being done, and has been done—I served on the Allegheny Conference's Manufacturing Committee, and Charles Porry, the chairman and chief executive officer of Alcoa, chaired that committee with Tom Murrin at the Westinghouse and a PPG representative. Our goal was to somehow find a way to see if there wasn't support for some of the fringe areas in the western Pennsylvania activity. That has not been very productive, because we can hardly keep up with the changing requirements. The small companies have had the same abusiveness from the economy as the steel industry. Sooner or later, most of our products ended in some steel industry products.

One of the areas that we have done, the Small Manufacturer's Counsel has provided many people for an advisory council for the Allegheny Community College. We have been a good source of talent, and it has been freely given. There is a particular—right this moment, going on a procurement session between the Purchasing Agents Association of Western Pennsylvania, in trying to find out if they can't get some mix and match activities through the large companies and the smaller companies in the area.

But, to be honest about it, it has been too difficult for us to keep up with the demise of our large customers, we just run as fast as we can to stay even, and most of us have not stayed even. We are aware of this and we are working against it.

Mr. **Walgren**. Would you warn us against trying to predict what employee skills would be required in even the near term?

Mr. **Hall**. Well, I am of the point of view that we speak very longingly of the opportunities in high technology that are going to come and give us all a great rosy future, but I would like to point out that all of these things are basic to technological programs of mechanics, pneumatics, and electronics. Computer sciences are bringing to us a faster way of recovering information and dispensing information, making us more alert to what to do, but a technical person has to train in those functions and be very, very ready to go at any moment that we get a rise in our local economy. So, I think the community college is well prepared. They have all the resources in the way of people—we have an extraordinary pool of people in this industrial area to provide the training and the basis for retraining. As I have said before, it does not only benefit students, but includes the great benefit of training the administrators, and having the instructors develop their own skills, and continue their skills, is the greatest reason to continue this activity, and enlarge it.

Mr. **Walgren**. Thank you very much. Congressman Boehlert.

Mr. **Boehlert**. Mr. Smith, are you familiar with the UAW-Ford pilot program, where there is a nickel an hour put into a training contract—do the steelworkers have anything like that?

Mr. **Smith**. No, we do not. As I indicated, the UAW, when they initiated that program, they arrived at that type of an agreement at the expiration of the term of the collective bargaining agreement, and they agreed that the part of the general wage package that was being pursued for the union, and ultimately agreed to between the parties, that a certain cents per man-hour worked of that general wage, actually would go into a fund to deal with the training needs for matched requirements or whatever, for those workers that were, both in-house, and also that would be permanently displaced.

We could not, as I indicated, in March 1983, when we made the initial thrust at the joint effort to deal with the problems that we foresaw in the steel industry—and that was a continuing decline—a continuing proliferation. As I pointed out, in 1983, we went for the first time in history, to the union, also, and management came to the table, for the first time, to deal with what is identified as concession bargaining. We were not there, really, talking about, in other words, a piece of pie and the possibility we were going to cut it up, and you get yours—we were there; both parties recognized that there was cash-flow problems and the decline of this industry was imminent if those cash-flow problems were not adjusted, or addressed in those negotiations. So we did not have an opportunity to get to that type of discussion about training needs, because we were dealing with the needs of keeping the companies afloat.

We look at Congressman Boehlert, the Trade Stabilization Act of 1984 had one source for the basic steel industry. The 1-percent set-aside in the Trade Stabilization Act, which would require the company, where those companies that are under the—where voluntary trade agreements had been reached by the President, that 1 percent of that net cash-flow of those companies that are involved, who are the ones identified under the 201 petition filed by the union, that they had to set-aside 1 percent of their net cash-flow for the purposes of the training, 99 percent for modernization of facilities. Those profits derived, the costs of those is the margin of your strength. We see that as a viable tool—that 1 percent, to deal with even the matching requirements that would come about as a part of this proposed Act. Unfortunately, at this point, and I would say because of the bureaucratic maze, as is present in Washington—we are not able to discern, really, at this point—this is long since overdue—what is being derived by these companies as far as the 1 percent is concerned. Department of Labor is up on this. There is some discussion going on between myself and top-level management people who are part of that 1 percent formula, on the tracing of what moneys are, in fact, being realized in applying the above mentioned formula of this factor. They have one interpretation, and we have quite another one.

There is a broad interpretation that one can place upon it, as it is written, that that money can likewise be used—that 1 percent—can likewise be used to upgrade the skills of the workers in the plant. The precise language of Congressman Pease, pursued in the House Ways and Means Committee, as it has been explained to us and as the way they read it in the strictest instructions. That money, precisely, is to be going to dislocated steelworkers. Those who are permanently displaced from the industry, because of the impact or threat. So, there is a lot of enemies, as far as trying to get to a point where cost is a conducive thing. But, at this point, our best bets have been that the companies do recognize their social responsibility in this area, and accordingly, Government likewise is recognizing theirs, in these instances where we have been able to look at, as you are aware, the use of the $10 million, set-aside from the Secretary's national discretionary account that was steel-specific; which required a 2-for-1 match by the State.

We just rounded out 19 States in pursuing those dollars. We have current programs being pursued in all of these States that received portions of that $10 million, some of that amount which the State of Pennsylvania received, that had to be matched on a 2-for-1 basis—the companies did not withdraw from the commitments they gave to us, prior to this announcement by the Secretary of the $10 million—their money is still there for match purposes, and we are pursuing programs on the basis of that match coming, because most of the State governments are saying that the 2-for-1 match that is being required of the State is totally unrealistic and they seek that obligation on to you, private industry in effect saying you help us make this two-for-one match, in order to get a portion of the $700,000 we receive for a steel-specific program—which has been a nightmare.

Most of the States, when you ask them to come up with a 2-for-1 match—most of the States, as you well know, we are talking about in-house services, the use of unemployment insurance benefits for those who have not been out 2 years—you cannot go retroactive and use it for the match purposes. You have got to deal with the use of unemployment benefits prospectively on the basis that those who are a part of a planned layoff as announced—you can use that for part of the match required. So, those are the requirements—that 2-for-1 match I pointed out, and quite—the exception is that I point it out to you, and I am sure you have heard of it in the Congress.

This has been a nightmare, and the States who are saying we have got our regular formula money, we are using that and not just for steel-specific projects. We have got a problem. The State of California, in fact, got $540,000 of that $10 million, and they sent it back to the Federal Government. They said we cannot use it, because we cannot make the match, you know? And we have already gone ahead with programs on the regular formula money that we believe will address the needs of those who are dislocated workers in the definition of the JTPA.

Mr. Boehlert. Mr. Slack, one more final question. What is the trend in PPG for funding of nonmanagement training programs inhouse? Have you leveled off, are you on the increase, behind, or what?

Mr. Slack. Well, we have an Educational Assistance Program that applies to almost all of our employees. When I say almost, I am not sure that it applies to all. I am talking about U.S. employees. We also have programs—we recognize the trend toward the need to understand computers, and we have made available to our employees a program whereby we provide them the opportunity to acquire a computer on an interest-free loan to some magnitude, with a gift certificate of $500 or so for software, so that they can become computer literate. I would say that there is still an increasing trend, and it is very slight, on the part of our employees trying to improve their skills.

The Educational Assistance Program is designed primarily for university-type courses, which, of course, would include community college, and various others. In the Pittsburgh area, that is still increasing slightly.

Mr. Boehlert. I would think the problem you face is an unusual problem, but the typical American is an eternal optimist, and that creates a problem. Because most people I have talked to in areas around the country, on the bill, that I feel so strongly about—individual training accounts, the biggest negative we find from people is that they will never participate, because most people think they go in, they work hard, they show up for work, they do what they are assigned, and they figure the job is going to be there—not realizing that in most cases the worker is going to be displaced, through no fault of his own, a couple of times in his career.

Mr. Slack. I agree with that. I am not a psychologist, but I think that all of us have the hope for eternal something, and regardless of what that may be, and I think that is coupled with—and I can empathize with these people—the fear of the unknown. If you take that individual who—Ms. Wilson, as an example, did an outstanding job by changing careers, but I bet she went through a lot of trauma in thinking about it—boy, am I going to be able to master those word processors, or whatever. And people are afraid of that. I agree with what you have said. I think it is just going to be very difficult. People are just reluctant to change.

Mr. **Boehlert**. I would like your names and addresses. I am going to send all three of you a package on the Individual Training Account concept and ask you, at your convenience, to get back to me and let me know what you think of it. You are, I think, Mr. Slack, a member of the Business Higher Education Forum, aren't you?

Mr. **Slack**. Not me, personally.

Mr. **Boehlert**. All right. I will send it out, I will send the packages to you, and ask you, at your convenience, to respond. I think the problem, at this point, is whether the United States is extremely serious and there is a tendency for too many of us to leave the good news of planning employment, and tending to think that everything is rosy, and it is far from that.

Mr. **Slack**. I would like to make one more comment. If anything works, I think, of course, it is better. I just got back from a trip to China, and I was there while the Chinese Government Congress Party was holding their recent employer congress, and I am sure you read about the changes that they have made, which are significant. But they are addressing some of the same issues—they do not have the same displaced-worker problem we have, but they are looking at the expenditures of large sums of money, in some way, for education.

They want to educate the masses, and their plan, then, is that within 10 years that population is going to be 1.3 billion people, and they are out seeking technology, and they want technology that is going to satisfy their internal demands. But, they have problems with our currency, which is a real problem for them. So, while they are getting the technology, which will satisfy the internal needs, some of that has to go out of China, in order to satisfy our currency problem. Where is it going to go? It gets back to what I had indicated earlier, that I am very much concerned about, there is opportunity there, but this is a world market. And what are we going to be looking at—the entire world. We cannot be looking at just one particular location and think we are going to solve the problems. We are not—it is getting worse.

Mr. Boehlert. Thank you very much.

Mr. **Slack**. Thank you.

Mr. **Walgren**. Thank you very much, all of you, for your being a resource to the committee. We certainly appreciate that. We will be looking forward to talking to you further about these kinds of things.

Well, let's go to the last panel, and I know that Congressman Boehlert is going to have to step away at some point to catch an airplane to the other coast, and I am hoping we can get through this panel before that has to happen, but if it does not you will know why he did slip away.

Jean Noble, the president of Noble Robots, and Warren Anderson, the vice president for Issues Management of Pittsburgh National Bank, welcome to our hearing, folks, and we are glad you are here. Let me just ask you to proceed, as we have, and start first with Ms. Noble. We appreciate your being here, and know that written statements will be made part of the record, and you can feel free to communicate what you would like to focus on or direct it any way you would like to go.

Thank you for coming.

STATEMENT OF JEAN NOBLE, PRESIDENT OF NOBLE ROBOTS, EXPORT, PA

Ms. **Noble**. Thank you, Congressman Walgren, for inviting me to testify today. I am so honored to be here. I am Jean Noble, president of Noble Robots, Inc., which is east of Pittsburgh. We develop robotic software, interface hardware with robots, and we educate people through symposiums, conferences, and seminars, since robotic engineers are needed right now.

As president of Noble Robots, I recognize three important areas, regarding robotics and House bill 2353. First, a need for trained robotic software engineers' exists today. Robotic software engineers, a phrase I have coined, are people trained to program robots. These software engineers are not involved in research and development, such as Carnegie-Mellon University and others, nor do these software specialists repair robots. Robotics software engineers design applications and code instructions for robots to execute. Currently, off-line programming, vision systems, and artificial intelligence are the robotic topics receiving the most attention. From attending national robotic conferences, working with many professionals and reading robotic publications, I observe that robotic hardware manufacturers and end-user industries need robotic software. Noble Robots' 5-year plan includes hiring people who are trained, or can be trained as robotic software engineers. Software specialists are currently needed in the workplace, and will continue to be needed in the future. Currently the demand for these people exceeds the supply. Tomorrow's applications will need these software engineers, as well as specialists in artificial intelligence. I feel community colleges can assist by training the robotics software engineers, through the help of bill 2353.

My second point, besides training software engineers, we need projects for productivity at community and technical colleges. Projects for productivity, a phrase I have coined, means engaging advanced technology on a work project as part of the learning process. As an adjunct faculty member at a local university for 8 years, I see students motivated only by grades; their assignments are completed, graded and tossed. Students leave the academic world, and enter a world which measures their productivity. Employers, like myself, then say educated, inexperienced people are not productive. Can productivity be taught? That is a tough question. One suggestion is projects for productivity, tied to funding, in House bill 2353.

Mr. **Walgren**. We are trying to quiet that down, by the way, so please proceed. It is all that pounding over next door. It is all right, but I apologize for the distraction.

Ms. NOBLE. For example, when a college purchases a robot, thought should be given to how the robot can work on projects for the college, using students to design and implement the applications. Robotic applications may include projects such as painting signs for the college, or community, assembling furniture which has been shipped, unassembled, or helping unload textbooks in the bookstore. Even if a college cannot afford robots for projects such as these—projects such as this small note holder could be done—could be assembled through the tabletop educational robot. This was built by two small tabletop educational robots, at the conference for advertisement for the company. It was glued, assembled, and given to me by a robot. The National Advanced Technician Training Act could encourage this type of activity, by requiring funding requests to contain a section outlining planned, productivity projects. Can productivity be taught? I feel it is worth a try.

My third, and final comment relates to the Symposium on Robots for the Handicapped, sponsored by Noble Robots. This symposium, held on May 23–24, at the Pittsburgh Greentree Marriott, resulted from researching the question, "could handicapped children use robots as teachers assistants?" During my conversations with many robotic and health care professionals, the need for a formal exchange of research became apparent. The Symposium on Robots for the Handicapped was an opportunity to expand our horizons and extend ourselves into the future. What did we learn about robots for the handicapped? Three points:

First, the technology is available, but end-user products are not being readily manufactured. Robots for nonmanufacturing applications are limited. Customizing manufacturing robots for handicapped consumers is not affordable to the general public at this time. However, many researchers are working with laboratory robots for future applications.

Second, a great need exists for health care professionals to be introduced to robotics and advanced technology as a whole. I feel community colleges could provide training for health care professionals through bill 2353.

Lastly, the future is bright for robots for the handicapped and the elderly. Researchers have worked extensively in this area. Robots will expand the horizons and extend the physical capabilities for many people in the next 5 years. Some day these robots will simply be known as miraculous machines.

Thank you very much for your time.

[The prepared statement of Ms. Noble follows:]

Testimony of Jean A. Noble,
President of Noble Robots, Inc.
5100 Old William Penn Highway
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(412-325-2563)

Given before Congressman Walgren,
Chairman Subcommittee on Science, Research, and Technology

on September 30, 1985
at Parkway West Area Technical School
Pittsburgh, Pennsylvania

Thank you Congressman Walgren and members of the Subcommittee on Science, Research, and Technology for inviting me to testify today. As President of Noble Robots, I recognize three important areas regarding robotics and H.R. 2353. First, a need for trained "robotic software engineers" exists today. "Robotic software engineers" (a phrase I have coined) are people trained to program robots. These software engineers are not involved in research and development activities, such as Carnegie-Mellon University and others, nor do these software specialists repair robots. "Robotic software engineers" design applications and code instructions for robots to execute. Currently, off-line programming, vision systems, and artificial intelligence are the robotic topics receiving the most attention. From attending national robotic conferences, working with professionals, and reading robotic publications, I observe that robotic hardware manufacturers and end-user industries need robotic software. Noble Robots' five-year plan includes hiring people who are trained or can be trained as "robotic software engineers". Software specialists are currently needed in the workplace and will continue to be needed in the future. Currently the demand for these people exceeds the supply. Tomorrow's applications will need these software engineers as well as specialists in artificial intelligence.

Besides training software engineers, we need "Projects for Productivity" at community and technical colleges. "Projects for Productivity" (a phrase I have coined) means engaging advanced technology on a work project as part of the learning process. As an adjunct faculty member of a local university for eight years, I see students motivated only by grades; their assignments are completed, graded, and tossed. Students leave the academic world and enter a world which measures their productivity. Employers, like myself, then say educated, inexperienced people are not productive. Can productivity be taught? That is a tough question. One suggestion is "Projects for Productivity" tied to funding. For example, when a college purchases a robot, thought should be given to how the robot can work on projects for the college using students to design and implement the application. Robotic applications may include projects such as painting signs for the college or community, assembling furniture which has been shipped unassembled, or helping unload textbooks in the bookstore. Even if a college could not afford robots for projects such as those mentioned above, projects such as this can be designed for small tabletop educational robots. This memo holder was assembled by two very small educational robots. The National Advanced Technician Training Act could encourage this type of activity by requiring funding requests to contain a section outlining planned productivity projects. Can productivity be taught? I feel it is worth a try.

My third and final comment relates to the Symposium on Robots for the Handicapped sponsored by Noble Robots. This symposium held on May 23-24, 1985 at the Pittsburgh Greentree Marriott resulted from researching the question "could handicapped children use robots as teacher's assistants ?". During my conversations with many robotic and health care professionals, the need for a formal exchange of research became apparent. The Symposium on Robots for the Handicapped was an opportunity to expand our horizons and extend ourselves into the future. What did we learn about robots for the handicapped?

(1) The technology is available, but end-user products are not being readily manufacturered. The number of robots for non-manufacturing applications is limited. Customizing manufacturing robots for handicapped consumers is not affordable to the general public at this time. However, many researchers are working with laboratory robots for future applications.

(2) A great need exists for health care professionals to be introduced to robotics and advanced technolgy as a whole.

(3) The future is bright for robots for the handicapped

(and the elderly!). Researchers have done extensive work. Robots will expand the horizons and extend the physical capabilites for many people in the next five years. Someday these robots will simply be known as "Miraculous Machines".

Thank you Congressman Walgren for your time.

Mr. WALGREN. Thank you. That is very interesting. I cannot help but be reminded of the futuristic books, one of which projects that each of us will be supplemented by a small computer at some point, and that it is essentially, simply an expansion of what goes on inside our thought processes all the time, but we can increase our power, and there is work we can do by having an adjunct computer that would expand the thought processes where we can process them within a certain period of time. Certainly we can start by seeing the add-on that these kinds of mechanical capabilities can provide for those who are handicapped in one way or another.

Let me turn, then, to Mr. Anderson, is it? And, Mr. Anderson, for the record, is accompanied by Clyde Jones who is involved in, as I understand it, their program, at Pittsburgh National Bank.

Mr. Anderson?

STATEMENT OF WARREN ANDERSON, VICE PRESIDENT FOR ISSUES MANAGEMENT OF PITTSBURGH NATIONAL BANK, PITTSBURGH, PA

Mr. ANDERSON. Thank you, Mr. Walgren. First of all, my name is Warren H. Anderson. Folks call me Sandy. I am the vice president of issues management at Pittsburgh National Bank, and I am a member of the business advisory board, for the Community College of Allegheny County's Institute for Training the Handicapped in Advanced Technology.

Just an aside before I start off; you mentioned, changing technology Congressman my son taught me to use a computer because I wanted to talk to him, so with his help I now use wordstar to do my work at the bank. Sometimes our children teach us, and I think that is part of an advanced technology. Another part of my work is as an adjunct professor of communications at Duquesne University. I teach ethics in communications. I brought with me Clyde Jones who is legally blind. He is also a first graduate of the institute for advanced technology, and he is now assistant programmer in the operations division at PNB, and I will get to him in just a minute.

First of all, it is a pleasure to testify on House bill 2353, on the National Advanced Technician Training Act. An exciting part of the community colleges' effort through the training of handicapped is that we do have a coalition—a coalition that now works. It is in being for now, probably more than a year, and it is a coalition of the Pennsylvania Vocational Rehabilitation Office, the Community College of Allegheny County, headed by the president, Jack Kraft, I see here, and people like Dan Press, Drezbylek who is also at the college. The college to conduct some really insightful training, through the community college resources.

Now, the business advisory council of the institute for training of handicapped, is a superior entity. It was initiated by Governor Thornburgh to act as a separate arm for the institute, to make sure that we maintain the interests of the business community.

The business advisory committee answers such questions as "what are the demands of the marketplace going to be in the near future?" These are the things we are looking for. As you well know, occupational forecasting is just a tremendously difficult thing to do. We are trying to interpret what skills will be needed to meet the demands of the marketplace. Then, what specific training should the handicapped have, in order to really fit into the business world, as soon as they walk into the front door. We also provide, a tremendous oversight capability, into the operations of the institute, and this is what you referred to earlier. We try to apply our business expertise to the operations of the institute itself, to make sure that the funds of the taxpayers are well-supervised; to make sure that the institute maintains its eye on helping the handicapped, not on increasing the bureaucracy of the programs, and you know how those things proliferate. I think we have been highly successful in doing this. Before the institute spends money, they look to us for expertise in where to go. About 3 weeks ago, I taught a class at the institute for the handicapped in job search, and I answered the students questions on what the employers were looking for, and what they needed to prove they could do before they went into the corporate world. Another thing the advisory committee provides is a real sense of networking. Some of these handicapped have been out of the networking system in the community, if you will, because they have been handicapped. We have got to work them back in. We become their true networking arm for the handicapped people. We show them where the contacts in the business community are, that many have not had access to before.

For example, about 6 months ago, Doug Danforth wrote a letter to all of the members of the business community in Pittsburgh, and talked about what the institute was trying to do, and how it would meet the community needs. In addition, we appointed a senior retired officer from Drao Corp. who knew what the business community needed and wanted us to provide, and he is now going out to the business community to interview prospective employers to provide internships for each of the handicapped who are graduates from the institute.

The other—really neat thing we provide is feedback into the institute. What the employers are telling us, based on what they have seen of our graduates. When I taught at the institute job search, I was always a little surprised, and very, very pleased, at the bright kind of people we had. They are just not the kind of people I expected. They were bright people. They were ambitious people. There were people who could do work, and contribute to the community. They were people who just did not want handouts. Many of them came in a wheelchair, but from the waist up, they were able to operate that computer just as good as you or I, and maybe a heck of a lot better because they were more concentrated on it. They knew that their fortunes and their future depended on that computer.

I looked at these folks, and I started answering their questions about the community. It is a scary world out there for all of us, and many times people in business do not know how to react to a blind person, as Clyde Jones can tell you. I mean, how do you shake hands, or those kinds of things. Clyde needs to be able to tell us those kinds of things. Pittsburgh National Bank prepared a brochure for the institute for training handicapped, which went throughout all the business community, and it said the institute for training handicapped in advanced technology, prepares handicapped people for unsubsidized employment in the private sector, by training the handicapped to program computers or applying computers to other sophisticated modern technology, to solve contemporary business problem.

What can the institute do for the business community. First of all, they evaluate the handicapped, and make sure that they are indeed, ready to occupy meaningful positions in the business community. It assures that people are assigned to the right training program to fit the business needs. We train people like Clyde on our newest equipment, and in our only community, and believe me, we have well used new handicapped equipment to help people like Clyde to read things that he cannot otherwise read. Then we meet with the employers to find out their specific needs for their employment.

Finally, what can the employer expect? He can expect some employee who is trained to do the job that he wants done. He can expect the Institute to work with him, every step of the way, including the people like us, who are on the board, to make sure that they meet their needs. He can expect followup action to make sure that the person sitting there is doing the job that the employer wants done.

We find that many of our graduates qualify for Job Training Partnership Act funds for their initial internship training, and we answer such questions for the business community. Are there problems with hiring the handicapped? Sure there are problems. Sure, you expect the handicapped person to have problems as a result of his or her handicapped. But you are not hiring the handicap. The prospective employer is hiring the capability. The person may not be able to walk, may have to come to work in a wheelchair, but he or she still possesses all the faculties necessary to perform that job for the employer. It has often been proven that handicapped people who are limited in pursuing some normal activities in life become more involved and more dedicated to aspects of their life that they can do—our accent is on capability and not handicap.

The true question here, today, is not so much handicapped as: "why the community college"? What can the community college do for us? I am a great fan of the community colleges. I think that first of all, the community colleges have free access to the local community. It is noninstitutionalized. It is not like putting some people off into a training facility for handicapped. It is part of the mainstream. It is really, when you put the training of the handicapped in the community college, you are, indeed, mainstreaming.

We are working on systems to try and put people in regular community college programs, and then to provide support for them from the Institute.

In addition the community colleges are close to home. You are not sending the handicapped off to another part of the State. While they are training, they can look for jobs close to their home, and they can come to work in places that are close to their home. I want to again say that what the Community College of Allegheny County, run by Jack Kraft and people like Dan Prezbylek, have really done a superb job building up an institute that was accessible and that was mainstreamed into the student activities. Clyde, and other members of the school can participate in all of the community college activities, social and sports, and everything else, as well.

I would now like to tell you more about this remarkable guy, Clyde Jones. Clyde is legally blind. He can see some things with the adjunct of special equipment to magnify. I would like to also say that Pittsburgh National Bank was not altogether altruistic in hiring Clyde Jones. We knew that he was a college graduate and that he had a BA from the University of Pennsylvania, and we knew he was talented. We knew he would, indeed, make a superior programmer. So we, in doing something for the institute, we did a lot for ourselves. Right now Clyde, has been at PNB for about 2½ months, and he has proven an overwhelming success. He can, indeed, do what all the other programmers can do, with the addition of some of the—some specialized equipment. Now I will let Clyde talk for himself.

Mr. JONES. Thank you, Sandy. Thank you, Congressmen. My name is Clyde Jones. I am associate programmer at PNB, and to give you a little bit of background about myself, I guess I sort of fit into the category of displaced worker, before this all took place at the institute. I was out of work approximately 5 years, until afforded the opportunity by Pittsburgh National Bank of employment. I was originally a social service worker, so I had to shift some gears and get some additional training into the computer field. I really found a valuable experience at the community college. I had not had an experience with a community college setting before. When I got there, I found that the training, and the instructors, and the people that I worked with, in general were quite adequate and superior in their training. I got a lot of training at the community college, plus a real good brushup on the skills that I had already gotten in a previous computer training program. Probably one of the most valuable aspect of the community college training was the interface between the business community and the students, themselves. Academics, and training are all well fine and good, but to get out into the community, meet the people, and actually have an experience afforded to you where you can show your skills, and get a job merited on those skills is something I found very valuable. The job search, as I said, had gone on for 5 years, and took a lot of decisionmaking on my part to shift into the new high-technology fields. I had been reading about it, and had much family discussion about it, and finally the decision was made, and I wound up at the community college, and the trial internship at PNB where, after they offered me a permanent position.

I found my experience at community college gave me very valuable skills to apply at Pittsburgh National Bank. The aid that I use is closed-circuit TV systems to magnify my listings, so that I can read my listings and make corrections, or switch my programs to do different things. However, I can use a regular terminal to do my work, with some software that PNB had just added to part of their system. I seem to be able to work quite well in that type of environment.

If I might add just a tangent to my presentation, I would like to agree with a lot of what was said today about educating folks in new technology. I believe that, perhaps, this is the real foot in the door that the handicapped person needs in our society. Technology is going to be able to provide things that we can not even imagine right not, and we need this opportunity—this chance to get in and find our own capabilities. I do not think anyone has asked for any special breaks. We just want to get in there and have our own capabilities found out. I also agree with the education—the 4 years of college education. I think it is good basic education, there is a great need for that relates to something that we can do in this business world. The community college system, I believe, is a very valuable part of this. I know when I graduated from high school, I was not altogether sure that I wanted to go to college. However, I made the decision to go to college, and I know other people who graduated with me, did not make that decision. At that time, there were not so many community college opportunities available. However, now, I have been talking with people, and they say they are going to community college. It is just a fantastic opportunity to learn computers, or learn whatever skills they need to have to belong with their career.

I would like to emphasize, also, again, the experience of working with the business community, including the Pittsburgh National Bank, and I would like to thank this advisory committee and the Congressmen for listening to my testimony, today.

Mr. **Walgren**. Thank you. It is good to have you. I want to apologize for Mr. Boehlert, who had to go. We live with those limitations on commitments and he had to go to get the one plane back to Washington, but I do want to impress for the record, our appreciation for him being here, and he will be an important player in what can happen with this kind of legislation, so I think it is good he came, and I certainly appreciate that.

Was there anything further, Mr. Anderson, that you wanted to add at this point, or was that the thrust of your presentation, was to turn it over to Mr. Jones at that point and let him finish it?

Mr. **Anderson**. Just one more thing, earlier, I have taught in community colleges and have worked with people in a host of educational endeavors. I found the expansion of the community colleges one of the great steps forward in the social change in the country today. Community colleges are acting on real need—a chance for people who never would have had a chance otherwise, to take a big step forward in society, and, especially for those people who are older. They can fit into a community college, and get involved with the school.

Mr. **Walgren**. Your point makes an—underscores some of the intent of the bill and I have not thought of it in that light. We do try to have an emphasis in the bill for the handicapped, because we believe that there is no reason that handicapped individuals cannot play a much larger role in the productivity of higher technology than they could have played in the basic technology of a steel mill, or the labor—the basic labor technology. You are underscoring the role of community colleges in mainstreaming exposure for the handicapped—really a very important one, because I do know that the concept of mainstreaming is very basic, and enables the handicapped to function productively, and to be available for work within the general community, rather than being sequestered and targeted solely on shop, that is otherwise aimed at the handicapped. Certainly the appreciation of the capabilities of the handicapped, as the capability as appreciating the capability of any person, is essential for having, really, a good shot at joining the productive society as we should be in. The ability of the community college to play a role in mainstreaming, particularly for the handicapped portion, is something that I had not fully appreciated before. But I think you really say it loud in your presentation.

Mr. ANDERSON. Congressman, if I may, the function of any college and—I can go right down the list of communities—is to teach people. It is especially beneficial to provide a place where people like Clyde can go to school and mainstream in the field they are interested in, and also come out and work in these same fields.

They say you measure a society by what it does for the values of people in that society, and Hubert Humphrey had several of them. I have always been struck by the fact that we really have not effectively provided a system for handicapped individuals to access to the work place. Lack of access has resulted in a tremendous amount of isolation, and magnifying handicaps. We have so much progress to make in that area, and this bill might be able, through Mr. Jones' experience, to give us a guide as to what can happen. It also underscores to me, essentially what we are doing here. We are talking about solving a problem, but we are talking about demonstrating some of the mechanisms of solution. The experience of Clyde Jones shows how you could broaden the horizons of the handicapped through regular employment, as a targeted demonstration of what might be done. We would be going very far beyond what the Federal Government has yet to do in our society, and which it would have done, what in the first sense it would have done, and so, I really do appreciate your physically demonstrating how successful this type of program can be. I also want to express our appreciation to you, Ms. Noble, for your testimony. Clearly, there is so much potential in the power that can be added to the handicapped through, not the most sophisticated robotics, but through things that we now know that they are able to do. You indicated at the current hearing that you have had some contact with the voice——

Ms. NOBLE. Voice recognition.

Mr. WALGREN. Voice recognition. What is going on in that area?

Ms. NOBLE. What is happening right now, is that there is a lot of progress. There are synthesizers being put on computers and robots to talk—for people that have vocal problems. These also work by recognition, where a person who might not be able to use their hands, or even some other part of their body to do their job, could control a robot—via voice. This is also being done with computers. The systems now are speaker-dependent and in some cases are regional dependent. They are not completely speaker-independent. There is a lot being done, the technology is there, and it will be placed into simple mechanical devices in the work place for the handicapped people. Possibly, if the handicapped cannot do something, they can get a device, to carry with them or to adapt to something already at the work place, for example—software for their computer. Mr. Jones here, possibly could use that, and use his voice, instead of having to find the typewriter.

Also, voice recognition is being used to control lights, air conditioning and appliances, so the handicapped person would not have to find the switch or the appliance to turn off.

Mr. WALGREN. Fantastic potential. The ability of some mechanical assist to enable some of the very difficult handicaps to function, can save so much energy for productive work, that there is just an amazing—there is a freeing capacity in this business that somehow should be taken measure of. I know that many handicapped people have to spend so much energy, simply to negotiate the process of getting up and getting ready for work, that by the time they overcome those barriers—I am thinking of quadriplegics, and people with real difficulty—physical handicaps, that the ability to give them some effective mechanical assist will literally enable them to be able to turn to productive work and, without having exhausted themselves in the process of getting ready to be there, and getting ready to do that. I hope that we can see a lot more affirmative action, with respect to the handicapped in our society as evidenced, thus far, and it may be that around the edges of this kind of a bill, we could find that, and demonstrating its potential at that point, and really turn on a lot of parts of the society that have not yet gotten to the point that Pittsburgh National Bank has, of appreciating what can be done by the handicapped people.

I wanted to ask Mr. Jones—your experience of searching for 5 years, and then, essentially finding something, via a network, where, I gather, there was some affirmative action by the employer to look for the ability to employ somebody who was faced with a physical limitation, is not very much different from the old boy network, where there was affirmative action by college alumni and graduate alumni to pick up the new graduates, even more affirmative action on the part of family and friends to pick up the sons and daughters of their acquaintances who were entering the work force. And yet, clearly, does that 5-year period of difficulties that indicate that something in the nature of outreach, from the employer, is necessary, and obviously so successful in this point, to a good employment search by those who face handicaps?

Mr. JONES. I am not so sure about an outreach, but perhaps for a general feeling of an awareness of the potentials and capabilities of a handicapped person. I guess to try to frame it in my perspective, I got to the point where I would send out resumes that would not even identify me as a handicapped or visually impaired person. And that relates because they would look at me as just—just as another employee. But because I was in such a difficult field—social services, and had a B.A., where a master's is almost required anymore, I think that also put some limitations on my search—but I would agree with you that employers in general probably need to take a look more closely at handicapped people, especially with the new technologies becoming available, simply because they will get a person who will be loyal and will demonstrate good work for that corporation.

Mr. **Walgren**. You know, I remember that the most effective political speaker in Allegheny County history, recent history was Leonard Stacey who was also visually handicapped. I remember him—thinking of this when you were talking to Mr. Anderson about the special abilities abilities that handicapped people have. I remember him saying that his technique was to be able to create an internal teleprompter, without the distractions of the audience or whether there was a commotion over here, or whether—or how many people were in front of him, or whether it was a camera or a person, and be able to concentrate his attention so completely on what it was he wanted to say, and how he could say it. Mr. Jones' presentation, without notes, without reading a text or any such thing, is an example of the same thing, that out of any kind of limitation comes a real ability that equals and surpasses what the rest of us bring to most circumstances. I hope that we can take out of this bill a real demonstration of what might be done in here, and—Mr. Anderson?

Mr. **Anderson**. You know, you mentioned earlier about the old boy network. You know, when I taught at the Institute—I noticed so many people had been totally shy of handicapped people; when they do work in a normal work place, they ask me the very same questions about the workplace: What kinds of questions should they expect? What do people want to know? How could they compete against people who have had 4 years of education? All of those little things teach our sons to remember about the marketplace. Some of these people never had the opportunity to get a hold of that kind of information. So you find that little insights about that company. They learn how to use the assess companies before they interview—they can use that marvelous computer. How they can fill up data banks. Employers in this community should look forward to hiring, that kind of people. People who can transfer information back and forth through this wonderful computer they are learning to use. This computer is—as you mentioned before, gives them an opportunity to accent their capabilities and not their handicaps. Once they get to the workplace, they can transceive information to bring it into the data banks. They do not have to walk and go get it.

Mr. **Walgren**. Ms. Noble, is there a pamphlet on the symposium you held for the handicapped that we might be able to have, and I would like to have that for part of the record, because this is an area that we want to be working on—it should be—it should enable us to win some converts to this whole process that we are about.

Well, all right. Let me thank you, on behalf of the committee, for being a resource to us, and for the contributions you have made to the record, today. I am looking forward to taking it back and trying to secure this for a number of individuals that would be helpful to the process of this becoming law, based on points that you have demonstrated are real and compelling in our hearing this morning.

So, with that, we will adjourn. Thank you very much.

[Whereupon, at 1:02 p.m., the subcommittee was adjourned.]

THE FIRST ANNUAL SYMPOSIUM ON

ROBOTS FOR THE HANDICAPPED

MAY 23-24, 1985
PITTSBURGH
GREEN TREE MARRIOTT
PITTSBURGH,
PENNSYLVANIA

Expanding Our Horizons — Extending Ourselves

Expanding Our Horizons — Extending Ourselves

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Welcome. . .

to the First Symposium on Robots for the Handicapped. Pittsburgh is known for its many bridges and now a new bridge is being built — a high tech bridge. This high tech bridge spans two technologies — robotics and human resources. The purpose of the symposium is reflected in the theme, "*Expanding Our Horizons - Extending Ourselves*". Experts from outstanding universities and organizations are here to introduce extensions for the handicapped. Thanks to the time and financial support of many organizations, businesses, and academic institutions this bridge is possible. The Robots for the Handicapped Symposium is a dream turned into a reality. It is a bridge built by believers.

Jean Noble

Jean Noble
Executive Director
Robots for the Handicapped

City of Pittsburgh
Richard S. Caliguiri, Mayor

First Annual Symposium
Robots for the Handicapped
Pittsburgh/Greentree Marriott
Pittsburgh, PA

I am pleased to extend a most cordial welcome to the distinguished speakers and guests attending the First Annual Symposium on Robots for the Handicapped.

I am delighted that you selected Pittsburgh as the site for your initial conference on this most intriguing aspect of technological research.

As you may know, several months ago the Pentagon announced its intention to locate the Software Engineering Institute in our City which represents an important breakthrough in supporting our efforts to promote the City as a base for high technology industry.

Our desire to develop the Pittsburgh area as a high-tech center complements the massive Renaissance II development program that has been taking place here over the past seven years -- a program in which some $3 billion dollars in public and private funds has been invested.

I hope that you will find time to view some of our Renaissance II projects as well as our many social, cultural and historic points of interest.

Above all, I hope that you conference is productive and enjoyable and that you will return again soon.

Very truly yours,

RICHARD S. CALIGUIRI

/aml

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GENERAL INFORMATION

Symposium Sessions

All sessions will be held in the Grand Ballroom at the Pittsburgh Green Tree Marriott. Full-course luncheons will be served in the Junior Ballroom on May 23 and 24 from 12:15-1:30 P.M..

Literature Table

Cosponsors of the symposium have high technology literature available for guests.

Social Event

Symposium guests are invited to meet cosponsors, speakers and members from the Pittsburgh Robotics International Chapter 298 on Thursday evening, May 23 from 7-10 P.M. at Cohoots at the Pittsburgh Green Tree Marriott. A cash bar will be available.

Travel

The Pittsburgh Green Tree Marriott is conveniently located off the Parkway West (I-79) at the Green Tree Exit, 10 minutes from Downtown Pittsburgh (Ft. Pitt Tunnel) and 15-20 minutes from the Greater Pittsburgh International Airport. Free transportation to and from the airport is provided by the Marriott Courtesy Car (use courtesy telephone at the airport for service). Also, free parking is provided at the hotel for guests driving to the symposium.

Accommodations

The Pittsburgh Green Tree Marriott has guaranteed special room rates for symposium participants: $79/single; $89/double. Reservations should be made directly with the hotel; the symposium must be mentioned to receive the special rate. An indoor swimming pool and exercise rooms are available for use by overnight guests. The Marriott also houses several fine restaurants with live entertainment nightly.

County of Allegheny
Board of County Commissioners
Pittsburgh, Pennsylvania

PROCLAMATION

WHEREAS, the Citizens and Government of Allegheny County are committed to both human dignity in behalf of handicapped persons and their general welfare, this noble purpose commanding our keenest vigilance; and

WHEREAS, we take great pride in the contributions persons with disabilities have made in medicine, science, education, the arts, law, government, and the many fields of technological advances when given an opportunity to use their talents; and

WHEREAS, recognizing that much can be done to open doors for full participation of disabled persons in the new technology of robotics, the Noble Robots firm and many organizations, businesses and academic institutions will co-sponsor the First Annual Symposium on Robots for the Handicapped in our community, May 23 and 24, espousing the theme, "Expanding Our Horizons--Extending Ourselves:" and

WHEREAS, the Symposium is designed for administrators and researchers from academic communities, government agencies, hospitals and evaluation centers, health care organizations, insurance companies, robotics manufacturers, and rehabilitation institutions to exchange ideas with experts from throughout the East in this rapidly growing area of research and technology:

NOW, THEREFORE, BE IT RESOLVED that this Board of County Commissioners does hereby commend Noble Robots and all the dedicated firms and institutions participating in this worthy Symposium on Robots for the Handicapped from which ideas, products and services may emerge to benefit all disabled persons that they may take their rightful place in the mainstream of our daily lives and fulfill their abilities as endowed by our Creator.

SYMPOSIUM SCHEDULE AT A GLANCE

Wednesday, May 22

7:00-10:00 P.M. Symposium guests and speakers get acquainted at Cohoots Pittsburgh Green Tree Marriott

Thursday, May 23

8:00-9:00 A.M.	Symposium Registration Coffee and Donuts
9:00-10:00 A.M.	Welcome **William R. Bauer** Keynote Address **Joseph F. Engelberger**
10:00-10:15 A.M.	Coffee and Donuts
10:15-10:45 A.M.	Session I **Mark B. Friedman**
10:45-11:15 A.M.	Session II **Stefan Michalowski**
11:15-11:45 A.M.	Session III **Cecil W. Thomas**
11:45-12:15 P.M.	Session IV **Joel E. Mittler**
	Luncheon in Junior Ballroom
1:30-2:00 P.M.	Session V **Mark B. Friedman**
2:00-2:30 P.M.	Session VI **Woody Seamone**
2:30-3:00 P.M.	Session VII **Edward Cain**
3:00-3:30 P.M.	Session VIII **William "Red" Whittaker**

Friday, May 24

8:00-9:00 A.M.	Symposium Registration Coffee and Donuts
9:00-10:00 A.M.	Keynote Address **K.G. Engelhardt**
10:00-10:15 A.M.	Coffee and Donuts
10:15-10:45 A.M.	Session IX **Walt Tremer**
10:45-11:15 A.M.	Session X **Kimberly A. Henry**
11:15-11:45 A.M.	Session XI **Elizabeth A. Lahm**
11:45-12:15 P.M.	Session XII **Elizabeth A. Lahm**
	Luncheon in Junior Ballroom
1:30-2:00 P.M.	Session XIII **Niki Delgado**
2:00-2:30 P.M.	Session XIV **Dan Zabo**
2:30-3:00 P.M.	Session XV **Bruce M. Gans**
3:00-3:30 P.M.	Session XVI **Jean A. Noble**

PRESENTATIONS THURSDAY

9:00-10:00 A.M.

Welcome

William R. Bauer, Director of Education
The Rehabilitation Institute of Pittsburgh

Keynote Address

Joseph F. Engelberger, Chairman
Transitions Research Corporation

"Need A Hand?"
The age-old cliche for offering help may soon become the watch word for a mobile, sensate robot offering personal services. The attribute which a robot might command in the next few years will be considered in detail and then related to the needs of the handicapped.

MORNING SESSIONS

Session I
10:15-10:45 A.M.

"Eye Control of Computers and Robots"
For the physically handicapped, the relative merits of voice and eye glazing and pointing are presented. Issues such as eyes versus voice control are discussed.

Mark B. Friedman, Robotics Research Engineer,
Robotics Institute, Carnegie-Mellon University, Pittsburgh, PA

Session II
10:45-11:15 A.M.

"Voice-controlled Robotic Arm for the Handicapped"
A clinical evaluation program at the Veterans Administration Medical Center in Palo Alto, California has demonstrated the feasibility of using a voice-controlled robot arm as a manipulation aid for the severely disabled. Current work is focusing on an advanced device that is characterized by omnidirectional mobility, a degree of sensation, an ability to model its environment and a multi-mode user interface. The overall goal is to enhance the Robotic Aid's utility by making it more functional and easier to use.

Stefan Michalowski, Senior Research Associate,
Department of Mechanical Engineering, Stanford University,
Stanford, CA

Session III
11:15-11:45 A.M.

"Tactile Perception in Occupational Therapy Patients"
Patients in tactile perception experiments had impaired sensation and mobility due to accident, disease, or surgery. The test required that the patients manipulate objects, recognize solids, evaluate textures, and perform other tactile tasks in the absence of visual sensing. These results on human performance impact on robotic tactile sensing strategy.

Cecil W. Thomas, Associate Professor of Biomedical
Engineering, Case Western Reserve University, Cleveland, OH

Session IV
11:45-12:15 P.M.

**"Special Ed in Robotics:
A New Assistant in the Classroom"**

The population of youngsters in special ed services represents a diverse group of disabling conditions. Postulative that robotics can be of assistance to many of these youngsters both in the classroom and daily lives, the presentation will address the characteristics of each handicapping condition and suggest robotic applications.

Joel E. Mittler, Assistant Dean, Faculty of Education,
C.W. Post Campus of Long Island University, Greenvale, NY

AFTERNOON SESSIONS

Session V
1:30-2:00 P.M.

"Wheelchair Navigation"

The range of possibilities for wheelchair navigation from power steering to autonomous navigation is presented. Discussion includes the role of distance sensing on automatic wheelchairs.

Mark B. Friedman, Robotic Research Engineer,
Robotics Institute, Carnegie-Mellon University, Pittsburgh, PA

Session VI
2:00-2:30 P.M.

**"Robot Arm-Worktable System
for Spinal Cord Injured Persons"**

Robot Arm-Worktable System has been developed to provide manipulative capability for high spinal cord injured persons. The system provides for tasks such as self feeding, handling reading material and using a phone or computer. Clinical evaluation results will be discussed.

Woody Seamone, Projects Manager Prosthetics/Orthopedics
Research Project, Applied Physics Laboratory,
The Johns Hopkins University, Laurel, MD

Session VII
2:30-3:00 P.M.

**"The Potential of Robotics:
Benefits or Barriers to the Handicapped?"**

This workshop will examine some of the current and future applications of robots for use as tools of daily living by the handicapped, the disabled, and the aged. These developments hold the potential to both improve the lives of these exceptional populations and also to serve as electronic barriers to their independence. The types of applications which are designed will determine whether robots are benefits or barriers to these populations. Some of these alternative implications of robots will be discussed.

Edward Cain, President, TAM (Technology and Media),
a division of the Council for Exceptional Children

Session VIII 3:00-3:30 P.M.	**"Mobile Robots — Prospects for the Handicapped"** Mobile robot research is driving technologies that will spin off invaluable applications for the handicapped. Research horizons include locomotion, control, perception, artificial intelligence, automated vision for navigation and improved man-machine interfaces. Potential benefits to the handicapped include transporters, pilotless servants, task advisors, and sensing enhancements. **William "Red" Whittaker,** Assistant Professor Civil Engineer/Director of Civil Engineer and Construction Robotics Laboratory, Carnegie-Mellon University, Pittsburgh, PA

SOCIAL EVENT

7:00-10:00 P.M.	Symposium guests are invited to meet cosponsors, speakers and members from the Pittsburgh Robotics International Chapter 298 on Thursday evening, May 23 from 7-10 P.M. at Cohoots at the Pittsburgh Green Tree Marriott. A cash bar will be available.

PRESENTATIONS FRIDAY

9:00-10:00 A.M.

Highlights of Thursday

William R. Bauer, Director of Education
The Rehabilitation Institute of Pittsburgh

Keynote Address

K.G. Engelhardt, Research Health Scientist, Prinicipal Investigator, Palo Alto Veterans Administration Medical Center, Palo Alto, CA

"Robots for People: The Next Frontier"
Robotic technology can be used to serve human beings with various levels of ability. No area offers a greater challenge to robot researchers, designers, developers, manufacturers, and marketers than the health and human service arena. Robotic technology offers new tools to augment and extend human capabilities. The helpful robot will demand the thoughtful synthesis of both "high tech and high touch" considerations.

MORNING SESSIONS

Session IX
10:15-10:45 A.M.

"Robotic Applications for Learning Disabled"
Robotics have direct application in the classroom, for all intellectual levels, elementary through high school. Specific projects being conducted by students are shown and discussed ranging from optic sensor control to industrial work cell simulation in the robotics lab. Direct application to learning disabled groups will be described and explored.

Walt Tremer, Director of Future Tech Center, Southern Leigh School District, Center Valley, PA

Session X
10:45-11:15 A.M.

"Robots for Multiply Handicapped Children: Helping Kids Be Kids"
A discussion of how robots can help multiply handicapped children enjoy a more active role in play and other exploratory activities.

Kimberly A. Henry, Rehabilitation Engineering Specialist, The Rehabilitation Institute of Pittsburgh, Pittsburgh, PA

Session XI
11:15-11:45 A.M.

Session XII
11:45-12:15 P.M.

"Handicapped Toddlers Controlling Their Environment"
Environmental controls through experimentation and manipulation, provide very young children with opportunities to develop cognition and language. Three types of computer-assisted environmental controls will be discussed. One method of increasing environmentally controlled options for severely handicapped toddlers will be demonstrated.

Elizabeth A. Lahm, Doctoral Student, George Mason University, Fairfax, VA

AFTERNOON SESSIONS

Session XIII
1:30-2:00 P.M.

"Robots for Handicapped Education"
Observations and implications of the emotional impact of robots on the handicapped child. These observations are the results of work done with handicapped children involving commercially manufactured robots in an educational setting. In each case, the robot was used as a teaching tool.

Niki Delgado, President, Rio Grande Robotics, Las Cruces, NM

Session XIV
2:00-2:30 P.M.

"Typical Solutions to Communication Impairments"
In the United States there are more than six million people that cannot either hear, talk, or write. This creates a serious barrier to their full participation in society. Recent advances in communication aids and assistive listening devices are now offering new options for disabled people to communicate more efficiently.

Dan Zabo, President, Disability Directions, Inc., Pittsburgh, PA

Session XV
2:30-3:00 P.M.

"Clinical Aspects of Rehabilitation Technology"
The effective provision of high technology aids and devices for the rehabilitation of severely disabled children and adults is a challenging clinical activity. Increasingly, computers, robots, sophisticated power wheelchairs, and other types of adaptive devices and systems are coming onto the commercial marketplace. The challenge to clinicians is to develop an effective system of health care delivery that optimally resolves the problems of the disabled person through the *appropriate* use of high technology. We will present the mechanisms and activites of a clinical service delivery system designed to implement the latest in technology for the needs of the disabled. We will highlight the differences in the clinical approach to problem solving for severely disabled patients contrasted with the technical approach to creating solutions to physical problems.

Bruce M. Gans, Chairman - Department of Rehabilitation Medicine, Tufts University School of Medicine,
Physiatrist - Chief, New England Medical Center, Boston, MA

Session XVI
3:00-3:30 P.M.

"Personal Robots as Teacher's Assistants for Handicapped Children"
Research investigates technical feasibility of integrating personal robots with voice recognition capabilities into the learning environments of physically disabled, non-speaking children who communicate via voice output communication aids.

Jean A. Noble, President, Noble Robots, Inc., Export, PA

ACKNOWLEDGEMENTS

Many people have given their time and talents for this bridge between two technologies. These people include advisory board members, cosponsors, speakers and others. In particular, we acknowledge the contributions of the following:

Ron Baillie
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Kenneth McGough
Dan Mottsman
Sue Murdock
Larry Noble
Linda Ortenzo
Timothy Parks
Ann Sanns
Rose Mary Surgent
Lee Taddonio
Blaine Walker

THE HANDICAPPED:

ADVANCING IN HIGH TECHNOLOGY

JUST RIGHT FOR YOUR HIGH-TECH JOB

INSTITUTE FOR TRAINING THE HANDICAPPED IN ADVANCED TECHNOLOGY

Community College of Allegheny County
808 Ridge Avenue
Jones Hall—Room 214
Pittsburgh, Pennsylvania 15212
Telephone 237-2767

THE HANDICAPPED:

ADVANCING IN HIGH TECHNOLOGY

JUST RIGHT FOR YOUR HIGH-TECH JOB

CCAC

WHAT IS THE INSTITUTE?

The Institute for Training The Handicapped in Advanced Technology prepares handicapped people for unsubsidized employment in the private sector by training them to program computers or to apply computers and other sophisticated modern technology to solve contemporary business problems

WHAT CAN THE INSTITUTE DO FOR YOU?

1. The Institute locates and evaluates handicapped people in the local community to determine their future suitability for private employment after training.
2. The Institute assigns selected handicapped persons to training programs in computer and other high technology applications that match the generic demands of the private sector to the capabilities of the handicapped person.
3. Selected handicapped applicants begin training on the newest computers and other high technology equipment in the Institute's High Technology Center located on the main campus of the Community College of Allegheny County. The training is paid for by the Commonwealth of Pennsylvania.
4. The Institute meets with prospective employers to determine their specific high technology employment needs.
5. The Institute then selects students, who have suitable generic training, and augments their training to concentrate on a prospective employer's specific needs.
6. The Institute recommends a 7 to 90 day **INTERNSHIP** through which the employer can provide more specific "on-the-job" training and can evaluate the intern for permanent employment.

FINALLY At the end of the internship period, we would hope the employer would offer the intern permanent employment. If, however, it is determined that a mutually comfortable match is not possible, the Institute will reassign the intern and select another candidate.

WHAT CAN YOU EXPECT IF YOU HIRE A TRAINED HANDICAPPED EMPLOYEE?

1. You can expect an employee who is trained to do the job you want done.
2. You can expect the Institute to work with you... every step of the way...to find and prepare a handicapped worker to meet **YOUR** high technology employment needs.
3. You can expect follow-up action by the Institute to counsel and help your new employee acclimate to your work atmosphere and will form support groups of Institute graduates.
4. You can expect the Institute to counsel, retrain or reassign any employee who, after a fair chance, does not meet your employment needs.

AND FINALLY You will find many of our graduates qualify for Job Training Partnership Act funds that can pay up to half of the first year salary of the person participating in "on-the-job" training.

ARE THERE PROBLEMS IN HIRING THE HANDICAPPED?

Sure, there are problems in hiring a handicapped person. Sure, you can expect a handicapped person to have problems as a result of his or her handicap. But you are not hiring a handicap, you are hiring a capability. A person who cannot walk may have to come to work in a wheelchair, but he or she can still possess all the faculties necessary to perform the job and perform the job well.

It has often been proven that handicapped people, who are limited from pursuing some of the normal acitivites of life, become more involved and more dedicated to aspects of their life that they can do. Our accent is on **CAPABILITY**, not **HANDICAPS**.

We of the Business Advisory Council are overseeing the Institute for Training the Handicapped in Advanced Technology to ensure that the institute is, in fact, preparing handicapped people:

- to do work that is needed by the private sector…
- to do work that meets or exceeds normal requirements…
- and to serve the needs of the employer, as well as, the handicapped person.

IS THERE ANYTHING EXTRA FOR THE EMPLOYER WHO HIRES THE HANDICAPPED?

You bet there is! We of the Business Advisory Council think you get something extra by hiring one of our handicapped graduates. We think you will have the satisfaction of knowing that...by hiring the qualified handicapped person...you fill the needs of a person who wants a chance to prove that a handicap is not a barrier. You also fill the needs of the community by turning a tax recipient into a taxpayer. And we believe you'll feel good about yourself because you not only filled your job with a qualified person, but you have also created an opportunity for a person to find a whole new life that contributes to our society.

COMMUNITY COLLEGES AND TECHNICIAN TRAINING

TUESDAY, NOVEMBER 19, 1985

House of Representatives,
Committee on Science and Technology,
Subcommittee on Science, Research and Technology,
Washington, DC.

The subcommittee met, pursuant to call, at 9:45 a.m., in room 2318, Rayburn House Office Building, Hon. Doug Walgren (chairman of the subcommittee) presiding.

Mr. Walgren. Well, let me call us to order and I apologize for the late start. The bridge I come across in the morning is a draw bridge and it chose, right when I should be on my way, to stop traffic.

This morning the Subcommittee on Science, Research and Technology continues hearings on H.R. 2353, entitled the National Advanced Technician Training Act.

Today's session follows a hearing held by this subcommittee on this same topic in Pittsburgh, PA, on September 30. And our purpose is to discuss this legislation in the context of the need to train and retrain technical personnel for business and industry.

We have all seen the reports and the headlines which decry the decline of our industries in the international marketplace. Many products made in the United States are no longer competitive with lower cost, high quality products from Japan and the Third World. One striking example is Japan's steel mills which produce an average of 700 or 1,000 tons per year, per employee, which is almost twice the rate of American producers. The same low-cost efficiency can be seen in Japan's consumer electronics and automobile industries.

And in order to compete in this environment, the U.S. industry must apply the latest in technologies and process innovations and to do that we have to have a skilled work force capable of successfully using this kind of new technology.

On May 2, I introduced H.R. 2353. This bill creates a Matching Grant Program in the National Science Foundation for the purpose of helping community colleges and other 2-year institutions develop model programs to train and retrain technical workers. Twenty million dollars is authorized under this proposed legislation for the first year of the program and $30 million for the 2 following years. Each grant would have to be matched by funds from non-Federal sources, such as State and local governments or private industry. The funds would be used under the anticipated legislation to develop technical programs and courses, to develop faculty resources, to organize cooperative training programs with local industry, and to purchase or otherwise access instructional equipment.

This bill outlines several categories of potential students for emphasis in setting up this program: Workers in need of retraining or upgrading of skills, workers displaced by plant closings or other kinds of technological change, working parents who need flexible class scheduling, young people just out of high school, and handicapped people with special needs.

Community colleges have qualities that make them ideal for such programs by offering low-cost accessible programs. This factor is particularly important to those with jobs and families. Almost 50 percent of community college students are beyond traditional college age and need flexible class schedules if they are to meet the other commitments in their lives.

Community colleges can design on-the-job training programs with local industry in such a way as to meet the needs of both the students and the industry. And, of course, they can attract and use faculty from industry to teach technical courses without having to completely remove that individual from the industry that they are involved with.

Since 47 percent of freshmen and sophmore college students attend the 1,300 community colleges that we have in this country, these institutions provide an opportunity to reach a major portion of the total number of college students who are potential technical workers. And by strengthening the technical programs at community colleges we can raise the level of technical skills for the entire work force.

Well, those are some of the things that can be said in—in support of this legislation.

[The prepared opening statements of Mr. Walgren and Mr. Boehlert follow:]

HONORABLE DOUG WALGREN (D-PA)
CHAIRMAN
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY
HEARING ON
H.R. 2353, THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT

NOVEMBER 19, 1985

THIS MORNING THE SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY CONTINUES ITS CONSIDERATION OF H.R. 2353, THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT. TODAY'S SESSION FOLLOWS A HEARING HELD BY THIS SUBCOMMITTEE ON THE SAME TOPIC IN PITTSBURGH, PENNSYLVANIA ON SEPTEMBER 30, 1985. OUR PURPOSE IS TO EXAMINE H.R. 2353 IN THE CONTEXT OF THE NEED TO TRAIN AND RETRAIN TECHNICAL PERSONNEL FOR BUSINESS AND INDUSTRY.

WE HAVE ALL SEEN THE REPORTS AND HEADLINES HERALDING THE DECLINE OF OUR INDUSTRIES IN THE INTERNATIONAL MARKETPLACE. MANY PRODUCTS MADE IN THE UNITED STATES ARE NO LONGER COMPETITIVE WITH THE LOWER COST, HIGH QUALITY PRODUCTS FROM JAPAN AND THE THIRD WORLD. FOR EXAMPLE, JAPAN'S MODERN STEEL MILLS PRODUCE AN AVERAGE OF 700 TO 1000 TONS PER YEAR PER EMPLOYEE, TWICE THE RATE OF AMERICAN PRODUCERS. THE SAME LOW COST EFFICIENCY CAN BE SEEN IN JAPAN'S CONSUMER ELECTRONICS AND AUTOMOBILE INDUSTRIES. IN ORDER TO COMPETE IN THIS ENVIRONMENT, U.S. INDUSTRY MUST APPLY THE LATEST TECHNOLOGIES AND PROCESS INNOVATIONS TO THE WORKPLACE. FURTHER, WE MUST HAVE A SKILLED WORKFORCE CAPABLE OF UNDERSTANDING AND SUCESSFULLY UTILIZING THESE INNOVATIONS.

ON MAY 2, 1985, I INTRODUCED H.R. 2353, THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT. THIS BILL CREATES A MATCHING GRANT PROGRAM IN THE NATIONAL SCIENCE FOUNDATION FOR THE PURPOSE OF HELPING COMMUNITY COLLEGES AND OTHER TWO YEAR INSTITUTIONS DEVELOP MODEL PROGRAMS TO TRAIN AND RETRAIN TECHNICAL WORKERS OF ALL AGES. TWENTY MILLION DOLLARS IS AUTHORIZED FOR THE FIRST YEAR OF THE PROGRAM AND THIRTY MILLION DOLLARS IN THE TWO FOLLOWING YEARS. EACH GRANT WOULD BE MATCHED BY FUNDS FROM NON-FEDERAL FUNDS SOURCES; SUCH AS STATE AND LOCAL GOVERNMENTS OR PRIVATE INDUSTRY. FUNDS WOULD BE USED TO DEVELOP TECHNICAL PROGRAMS AND COURSES, ENHANCE FACULTY RESOURCES, ORGANIZE COOPERATIVE TRAINING PROGRAMS WITH LOCAL INDUSTRY, AND PURCHASE OR RENT INSTRUCTIONAL EQUIPMENT.

H.R. 2353 OUTLINES SEVERAL CATEGORIES OF POTENTIAL STUDENTS FOR EMPHASIS IN SETTING UP THIS PROGRAM: WORKERS IN NEED OF RETRAINING OR UPGRADING OF THEIR SKILLS, WORKERS DISPLACED BY PLANT CLOSINGS AND TECHNOLOGICAL CHANGE, WORKING PEOPLE AND PARENTS WHO NEED FLEXIBLE CLASS SCHEDULING, YOUNG PEOPLE JUST OUT OF HIGH SCHOOL, AND HANDICAPPED PEOPLE WITH SPECIAL NEEDS.

COMMUNITY COLLEGES HAVE QUALITIES THAT MAKE THEM IDEAL FOR SUCH A PROGRAM BY OFFERING LOW-COST AND ACCESSIBLE PROGRAMS. THIS FACTOR IS PARTICULARLY IMPORTANT TO THOSE ADULTS WITH JOBS AND FAMILIES. ALMOST FIFTY PERCENT OF COMMUNITY COLLEGE STUDENTS ARE BEYOND TRADITIONAL COLLEGE AGE AND THEY NEED FLEXIBLE CLASS SCHEDULES. COMMUNITY COLLEGES CAN DESIGN ON-THE-JOB-TRAINING PROGRAMS WITH LOCAL INDUSTRY IN SUCH A WAY AS TO MEET THE NEEDS

OF BOTH STUDENTS AND INDUSTRY. ALSO, COMMUNITY COLLEGES CAN ATTRACT FACULTY FROM INDUSTRY TO TEACH TECHNICAL COURSES RELATED TO THEIR FIELD OF WORK.

SINCE FORTY-SEVEN PERCENT OF FRESHMAN AND SOPHMORE COLLEGE STUDENTS ATTEND THE 1300 COMMUNITY COLLEGES NATIONWIDE, THESE INSTITUTIONS PROVIDE AN OPPORTUNITY TO REACH A MAJOR PORTION OF THE TOTAL NUMBER OF COLLEGE STUDENTS WHO ARE POTENTIAL TECHNICAL WORKERS. BY STRENGTHENING THE TECHNICAL PROGRAMS AT COMMUNITY COLLEGES WE CAN RAISE THE LEVEL OF TECHNICAL SKILLS FOR THE ENTIRE WORKFORCE.

I WANT TO WELCOME OUR FIRST PANEL OF WITNESSES WHO REPRESENT COMMUNITY COLLEGES FROM AROUND THE COUNTRY. THE SECOND PANEL WILL BE COMPRISED OF REPRESENTATIVES FROM BUSINESS AND INDUSTRY. ALSO, DR. JOHN MOORE, DEPUTY DIRECTOR OF THE NATIONAL SCIENCE FOUNDATION WILL JOIN US LATER.

Opening Statement for the
Honorable Sherwood Boehlert (R-NY)
Subcommittee on Science, Research and Technology

November 19, 1985

Mr. Chairman:

This morning's hearing addresses a fundamental question: How are we going to develop the workforce of the future?

It has become cliche to point out that our economy is facing unprecedented challenges and must be modernized to survive. And yet, despite the familiarity of these Jeremiads, we are doing remarkably little to meet the challenge.

We have been especially negligent in the field of worker training.

We like to pretend sometimes that fixing our economy is simply a matter of buying some new machines. Government itself helps foster this illusion by appropriating money and granting tax breaks for new equipment, while programs to train and retrain workers go begging.

This imbalance must be redressed. To build a healthy economy, we have to retool our workers as well as our machines.

Indeed, a General Electric executive testified at our Utica hearing that "the availability of skilled people has been the limiting factor in our efforts over the last three years to build up programs in such critical areas as artificial intelligence, machine vision and computer-aided design."

His views were echoed by other witnesses, and the lack of skilled personnel he described is a problem throughout all the stages of the production process.

Government, industry and academia have to work together to eliminate this shortage.

H.R. 2353 recognizes the urgent need for that joint effort. It recognizes that we have to devote more money to job training. It acknowledges that community colleges are the best providers of that training. And it accepts that the way to promote economic growth and to reduce unemployment is not to hamper economic change but to prepare for it.

However, despite those strong points, I still have to question the wisdom of this bill.

Several federal agencies, most notably the departments of Education and of Labor, already run numerous training programs. Dr. Michael Schafer, the president of Mohawk Valley Community College in my hometown of Utica, will testify this morning that he has identified 21 different offices that deal with job training.

I think we might accomplish more by improving and expanding existing programs than by creating yet another training bureaucracy, particularly one at NSF--an agency whose lack of experience in job training is exceeded only by its lack of desire to gain that experience.

I look forward to working with Chairman Walgren and the other Members of this Committee to design the best, most efficient program to channel money to our community colleges for job training. I fear that H.R. 2353 may not be it.

Our efforts should not be limited to improving existing approaches. Pat Choate of TRW, who we'll also hear from this morning, has come up with an innovative, forward-looking proposal to supplement existing programs--the Individual Training Account (ITA).

Rep. Richard Durbin and I have followed up on Pat's work by co-authoring H.R. 26, which would allow workers to open tax-free ITAs to insure themselves against future job loss. We're up to 88 co-sponsors, and I urge my colleagues to sign on.

We have to do more to help current and future workers adapt to economic change. I look forward to hearing today's testimony, which should give us a clearer idea of just how we should go about achieving this goal.

Mr. **Walgren**. I want to welcome our first panel of witnesses who represent community colleges from around the country. If that's the way—the order in which we are going. Let's see here. And joining that panel will be Dr. John Moore, the Deputy Director of the National Science Foundation. So if we can—Dr. Moore is to the table there, and I will get my glasses out shortly. And joining him in that panel would be Dr. Dwight Davis, a vice president of Wausau Insurance Co.; Pat Choate from TRW; and Mrs. Sheila Korhammer from Northampton Community College. We appreciate your coming and being a resource to the committee. I want to extend a particular welcome to Mr. Choate, who is—is it Mister or Doctor?

[No response.]

Mr. **Walgren**. People Choate [laughter]. Person Choate.

He has been such a tremendous resource to the society as a whole, and we particularly appreciate your coming and joining us in this discussion.

With that, let's go through the witnesses and written statements will be made part of the record, without more, and you can feel free to—to outline or summarize, or read particular parts in whatever way you feel makes the point you would like to make best. And so let's go through the statements, then, in the order that I have called you.

Dr. Moore.

STATEMENTS OF JOHN H. MOORE, DEPUTY DIRECTOR, NATIONAL SCIENCE FOUNDATION; SHEILA M. KORHAMMER, MEMBER, GOVERNING BOARD, NORTHAMPTON COUNTY AREA COMMUNITY COLLEGE, EASTON, PA; AND PAT CHOATE, TRW, ARLINGTON, VA

Mr. **Moore**. Thank you.

Mr. **Walgren**. Welcome to the committee.

Mr. **Moore**. Thank you, Mr. Chairman.

I am here today to present the views of the National Science Foundation on H.R. 2353, the National Advanced Technician Training Act.

As you have outlined, this legislation would authorize NSF to carry out a 3-year program through which accredited community and technical colleges would provide training in selected technical occupations. These programs would be designed for individuals in need of retraining to keep their jobs, who are unemployed as a result of plant closings or technological change, or who have recently left high school.

Mr. Chairman, the purposes of this legislation are certainly sound. I agree that:

No. 1, the Nation needs an expanded skilled work force in advanced technologies.

No. 2, improved productivity is critically important in many industries.

And, No. 3, we as a nation must become more competitive in international trade.

There is an indisputable need to address these issues. However, I believe that the role mandated for the National Science Foundation in the legislation is not appropriate to the Foundation. And my conclusion is based on two reasons:

First, is the magnitude of the problem. As you have just mentioned, there are approximately 1,300 accredited community colleges in the United States. They serve over 4.7 million students. This size is a great strength. The system of community colleges, as you have pointed out, is a valuable resource for attacking the problem.

NSF, however, has little experience at working with such large numbers of institutions or with occupational training programs. The Departments of Education and Labor have traditionally been the Federal agencies responsible for such programs. I would point out that in fiscal 1986, the Department of Education will invest about $830 million in programs authorized through the Carl D. Perkins Vocational Education Act. These funds are matched 10 to 1 by State governments, so for every Federal dollar, the States add another 10. In the Labor Department, programs authorized by the Job Training Partnerships Act total about $3.5 billion for fiscal 1986.

In both cases the emphasis is appropriately on State and local control of the disposition of the funds and design of the programs. Community colleges are key recipients of funds and providers of services under both programs.

In addition, the Department of Defense has successfully administered its own specialized skill training activities for several years; the program is funded at $614 million in fiscal 1985.

I also note that by far the largest single sponsor of training and retraining programs in the country is industry. The American Society for Training and Development estimates that private companies invest $26 to $30 billion in training annually. These efforts dwarf the entire NSF budget, let alone that part of it devoted to education.

The second aspect is the nature of the problem. In our judgment, the problem of retraining seems largely to be one of delivery of appropriate services rather than one of research or materials development. In the primary expertise of the National Science Foundation lies in the latter area, namely, research—research or materials development. NSF does not have the resources to deal with the delivery problem of this magnitude.

We should recognize that the roots of the Nation's vocational training problems lie in the quality of education provided our young people at the elementary and secondary levels. The National Academy of Sciences recent report on high schools and the changing workplace articulates this very well. The panel's basic findings are:

First, the major asset required by employers of high school graduates is the ability to learn and to adapt to changes in the workplace. Constantly changing work functions that will take place in the future have taken place in the past, but perhaps more rapidly in the future, will require that workers master new knowledge and new skills throughout their working lives. The ability to learn will be essential for the successful employee.

Primary and secondary schools must provide the basic understanding and skills needed both to perform entry-level jobs and to continue learning. Technical and vocational training can enhance a student's employability, but can't really substitute for this basic education.

Now let me make a few comments on what the National Science Foundation might be able to contribute to this—this set of problems.

I believe that the NSF can contribute to the purposes of H.R. 2353, but in a different way. Our primary responsibility at NSF is to maintain and strengthen the science and engineering base of the Nation. We must ensure that the research enterprise is healthy and can create the new knowledge essential to improvements in technology, which are in turn crucial to our competitiveness.

We also have a role in fostering excellence in science and mathematics education. That role is to foster links between the scientific and engineering research communities and the education system so that the latest scientific results can be brought into the curriculum, and the latest developments in the sciences of how people learn can be used in teaching.

Under the leadership of your committee, the Congress has enacted legislation to authorize NSF's programs for fiscal 1986. And as you know, this law authorizes funding for NSF's Programs in science and engineering education.

Within those programs we are authorized to undertake several types of activities, which include training for pre-college mathematics and science teachers; materials development and methods research for all levels of mathematics, science and engineering education; college instructional equipment; and graduate fellowships, among others.

My point in recounting the NSF fiscal 1986 programs is to make it clear that the National Science Foundation has a full agenda of responsibilities in both research ands education. I will say that these responsibilities cannot be sustained if they are expanded or our budgetary resources that are now available to us are stretched further.

I would also like to point out that we are emerging from a period of redevelopment of our science education programs. We undertook this redevelopment in order to achieve a more cohesive set of goals. In the last 2 years our budget and programs have stabilized by going from $57 million in fiscal 1984 to $82 million in fiscal 1985, and $87 million in fiscal 1986. We believe that this is not the appropriate time within the context of that particular area to add new programs.

As we look beyond fiscal 1986, we are concerned, as I am sure you will be, that we have fewer monetary and manpower resources at NSF to carry out our fundamental missions.

Given NSF's budget and the magnitude of the problem H.R. 2353 addresses, and recognizing the importance of that problem, we conclude that we cannot play a significant role. And for that reason, as well as the others I have mentioned, our position is that we can't support the bill.

Thank you very much.

[The prepared statement of Mr. Moore follows:]

National
Science
Foundation

Testimony

on

HR 2353

The National Advanced Technician

Training Act

Subcommittee on Science, Research and Technnology

Committee on Science and Technology

U.S. House of Representatives

By

Dr. John H. Moore

Deputy Director

National Science Foundation

November 19, 1985

Mr. Chairman:

My name is John H. Moore and I am Deputy Director of the National Science Foundation (NSF). I am here today to present the views of the Foundation on HR 2353, The National Advanced Technician Training Act.

The proposed legislation would authorize the National Science Foundation to carry out a three-year program through which accredited community and technical colleges would provide training in selected technical occupations. The programs would be designed for individuals in need of retraining to keep their jobs, who are unemployed as a result of plant closings or technological change, or who have recently left high school.

The purposes of the legislation are certainly sound. I agree that:

1) The Nation needs an expanded skilled work force in advanced technologies.

2) Improved productivity is critically important in many industries.

3) The Nation must become more competitive in international trade.

There is an indisputable need to address these issues. However, I believe that the role mandated for the National Science Foundation in the legislation is not appropriate. My conclusion is based on two reasons:

First, the magnitude of the problem.

There are approximately 1300 accredited community colleges in the U.S. They serve over 4.7 million students. This size is a great strength. The system of community colleges is a valuable resource for attacking the problem.

NSF, however, has little experience at working with such large numbers of institutions, or with occupational training programs. The Departments of Education and Labor have traditionally been the Federal agencies responsible for such programs. In FY 1986 the Department of Education will invest about $830 million in programs authorized through the Carl D. Perkins Vocational Education Act. These funds are matched ten to one by State governments--i.e., for every Federal dollar the State adds another $10. In the Labor Department, programs authorized by the Job Training Partnerships Act total about $3.5 billion for FY 1986.

In both cases the emphasis is appropriately on State and local control of the disposition of the funds and the design of programs. Community colleges are key recipients of funds and providers of services under both programs.,

In addition, the Department of Defense has successfully administered its own "specialized skill" training activities for several years; the program is funded at $614 million in FY 1985.

By far the largest single sponsor of training and retraining programs, however, is industry. The American Society for Training and Development estimates that private companies invest $26-30 billion in training annually. These efforts dwarf the entire NSF budget, let alone that part of it devoted to education.

Second, the nature of the problem.

In our judgment, the problem of retraining seems largely to be one of delivery of the appropriate services rather than one of research or materials development. The primary expertise of the National Science Foundation lies in the latter area. The NSF certainly does not have the resources to deal with a delivery problem of this magnitude.

We should recognize that the roots of our nation's vocational training problems lie in the quality of education provided our young people at the elementary and secondary levels. The National Academy of Sciences recent report on High Schools and the Changing Workplace articulates this very well. That panel's basic findings are that:

- The major asset required by employers of high school graduates is the ability to learn and to adapt to changes in the workplace. Constantly changing work functions will require that workers master new knowledge and new skills throughout their working lives. The ability to learn will be essential for the successful employee.
- Primary and secondary schools must provide the basic understanding and skills needed both to perform entry-level jobs and to continue learning. Technical and vocational training can enhance a student's employability, but cannot substitute for this basic education.
- A positive attitude and sound work habits are of basic importance. Employers place a high value on reliability and cooperation. At the same time, with increased employee participation in decisionmaking, the ability to offer constructive dissent without hindering teamwork will assume greater importance.

What can the National Science Foundation contribute?

I believe that the National Science Foundation can contribute to the purposes of HR 2353, but in a different way than outlined in the bill. Our primary responsibility is to maintain and strengthen the science and engineering base of the Nation. We must ensure that the research enterprise is healthy and can create the new knowledge essential to improvements in technology, which are in turn crucial to our competitiveness.

We also have a role in fostering excellence in science and mathematics education. That role is to foster links between the scientific and engineering research communities and the education system so that the latest scientific results can be brought into the curriculum, and the latest developments in the sciences of how people learn can be used in teaching.

Under the leadership of your Committee, the Congress has just enacted and the President has just signed legislation to authorize the National Science Foundation programs for FY 1986. As you know, this law authorizes funding for NSF's programs in science and engineering education.

Within the Science Education programs we are authorized to undertake several types of activities including:

- training for precollege mathematics and science teachers;
- materials development and methods research for all levels of mathematics, science and engineering education;
- college instructional equipment; and
- graduate fellowships.

My point in recounting the National Science Foundation FY 1986 programs here is to make it clear that the National Science Foundation has a full agenda of responsibilities in both research and education. These responsibilities cannot be sustained if they are expanded or our budget stretched further.

Let me remind you that we are emerging from a period of redevelopment of our science education programs. We undertook this in order to achieve a more cohesive set of goals. In the last two years our budget and programs have stabilized by going from $57 million in FY 1984 to $82 million in FY 85 and to $87 million in FY 1986. This is not the appropriate time to add new programs.

As we look beyond FY 1986, we are concerned, as I'm sure you are, that we will have fewer monetary and manpower resources at NSF to carry out our fundamental missions.

Given NSF's budget and the magnitude of the problem HR 2353 addresses, we cannot play a significant role. We consequently cannot support the bill.

Mr. **Walgren**. Thank you, Dr. Moore. Let's turn then to Mrs. Korhammer.

Mrs. **Korhammer**. Mr. Chairman and members of the Subcommittee on Science, Research and Technology, I appreciate this opportunity to testify and to bring you the views of a community college trustee in support of your bill, H.R. 2353. My name is Sheila Korhammer. I am a 12-year member of the governing board of Northampton County Area Community College in Pennsylvania.

I served the 1983-84 term as president of the Association of Community College Trustees, the national organization that represents the boards of some 800 public 2-year colleges across the Nation. I am sure I speak for fellow trustees across the country in thanking you, Mr. Chairman, for your vision and steadfast leadership on H.R. 2353. The industry-college partnerships that it promotes can be very significant to the economic progress of our Nation.

In pointing out that community colleges have become the largest branch of American higher education, currently serving some 9 million students, a majority of them women, and most of whom also are working adults seeking new or better careers, I feel sincerely that Congress is not using community colleges to the advantage it should in the accomplishment of national goals.

Community colleges provide more adult literacy training than any other postsecondary institutions, yet they are conspicuously underutilized in the Federal programs that support adult basic education. Community colleges also serve the majority of the disabled who are pursuing postsecondary education, yet they are not drawing the support they should from the Rehabilitation Act and the vocational rehabilitation programs.

Community colleges serve more minorities than any other branch of postsecondary education, yet they are underserved by the Higher Education Act programs expressly intended to benefit minorities, such as title III and TRIO.

Community colleges enroll the majority of Americans who are now starting college, yet this great stream of talent is essentially ignored by the National Science Foundation. By contrast, the private sector's utilization of community colleges has grown dramatically. Our institutions are the largest source of adult skill training for industry outside industry itself.

We simply want to challenge the Congress to take better advantage of the community colleges. We want to say to Congress what we say to our own communities: "Take advantage of our programs. We're there for your benefit. Use us!"

I say this—I say all this, Mr. Chairman, simply because we believe your bill, H.R. 2353, represents the kind of forward-thinking national policy that would put the community colleges to work in ways more advantageous to the national interest.

H.R. 2353, the Walgren bill, is designed to stimulate the more rapid growth of these partnerships. If our country is going to continue to lead the world in new technology, if the fruits that go with continued global leadership in technology are going to be enjoyed by both the U.S. economy and the work force, a strong supply of highly trained technicians will be as important as the technology itself.

A very symbiotic relationship is at work in these programs. They often entail two-way learning reaching well beyond the course content itself. Students and faculty reap the practical rewards of hands-on experience in advancing technology and state-of-the-art systems. A more tangible payoff for the employer is not unusual. It takes the form of higher productivity and increased profits, growing out of the creative input that faculty and students make when they use the business systems and production processes of the employer. More than a few college presidents whose institutions are strong in employer-specific offerings have told me, "We are helping industry and business change. We are helping industries perfect their technology."

The stronger the supply of technicians, Mr. Chairman, the easier it will be for American industry to turn new technological discoveries into new business ventures generating new jobs and more profits. The supply of technicians will be equally essential in the long run, we believe, in enabling the research establishment to keep our country on the leading edge of both science and technology. This is the potential that community colleges see in H.R. 2353.

For the same reasons, the bill also spells potential of revenue enhancement for the Federal Government. We see the modest Federal investment that the bill proposes leading to the same revenue enhancement that is being realized from the Cooperative Education Program, under title VIII of the Higher Education Act, perhaps on a still greater scale.

H.R. 2353 has the wholehearted support of the Joint Commission on Federal Relations of the Association of Community College Trustees and the American Association of Community and Junior Colleges. The two associations formed the joint commission for the express purpose of giving the community colleges one agenda and one voice on Federal priorities. On behalf of the Joint Commission, Frank Mensel, whom you know well, leads the Federal relations staffs for both associations.

Our joint commission, Mr. Chairman, is also supporting the top recommendation of the President's Commission on Industrial Competitiveness in urging the formation of a Cabinet-level Department of Science and Technology. In its published report last January, the President's Commission, composed largely of top executives of major corporations, declared:

A Cabinet-level Department of Science and Technology should be created to promote national interest in and policies for research and technological innovation. Comprising major civilian research and development [R&D] agencies, the Department would increase the effectiveness of R&D in meeting long-term national goals by making clear the national importance of science and technology in enhancing industrial competitiveness; establishing an authoritative voice within Government to deal with science and technology issues; improving the management of Federal R&D in included laboratories and agencies; and coordinating the management of Federal science and technology policy with other organizations.

Short of establishing such a department, Mr. Chairman, this committee perhaps ought to consider using H.R. 2353 to authorize and establish an Office of Applied Science and Technology at NSF to lead the program your bill proposes.

It is further urged by the President's Commission on Industrial Competitiveness that universities, industry, and Government must work together to improve both the quality and quantity of manufacturing-related education.

Under its recommendation, which is improve work force skills, the President's Commission goes on to stress:

Employer investment in employee training encouraged through macroeconomic strategies designed to maintain economic expansion and reduce unemployment; balanced tax treatment of employer investments in human and physical capital; strengthened capacity of vocational education institutions and community colleges to provide customized training programs; and removal of tax disincentives for individuals being trained through employer-financed education programs.

It is our conclusion and our ardent conviction, Mr. Chairman, that a working relationship between research and applied science and applied technology is long overdue at NSF. If NSF cannot accommodate such a program, then it is clearly in the national interest that Congress should establish a Department of Science and Technology with such a relationship ranking high in its mission.

We thank you again for this hearing on these national concerns.

[The prepared statement of Mrs. Korhammer follows:]

TESTIMONY
ON
H.R. 2353
THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT

BEFORE

SUBCOMMITTEE ON SCIENCE, RESEARCH, AND TECHNOLOGY
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

BY

SHEILA M. KORHAMMER
Past President of the Association of Community College Trustees
and member of the Board of Trustees of Northampton County
Area Community College, Easton, Pennsylvania

November 19, 1985
Washington, D.C.

MR. CHAIRMAN, I appreciate this opportunity to testify and to bring you the views of a community college trustee in support of your bill, H.R. 2353. My name is Sheila Korhammer, a member of the governing board of the Northampton County Area Community College in Pennsylvania. I served the 1983-84 term as President of the Association of Community College Trustees, the national organization that represents the boards of some 800 public two-year colleges across the nation. I am sure I speak for fellow trustees across the country in thanking you, Mr. Chairman, for your vision and steadfast leadership on H.R. 2353. The industry-college partnerships that it promotes can be very significant to the economic progress of the nation.

In pointing out that community colleges have become the largest branch of American higher education, currently serving some nine million students, a majority of them women, and most of whom also are working adults seeking new or better careers, I feel sincerely that Congress is not using community colleges to the advantage it should in the accomplishment of national goals.

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The Walgren bill is designed to stimulate the more rapid growth of these partnerships. If our country is going to continue to lead the world in new technology, if the fruits that go with continued global leadership in technology are going to be enjoyed by both the U.S. economy and the workforce, a strong supply of highly trained technicians will be as important as the technology itself.

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It is our conclusion and our ardent conviction, Mr. Chairman, that a working relationship between research and applied science and applied technology is long overdue at NSF. If NSF cannot accommodate such a program, then it is clearly in the national interest that Congress should establish a Department of Science and Technology with such a relationship ranking high in its mission. We thank you again for this hearing on these national concerns.

Mr. **Walgren**. Thank you very much, Mrs. Korhammer.

Mr. **Choate**. Thank you, Mr. Chairman, and members of the committee. I am pleased to have the opportunity to share some thoughts with you this morning on H.R. 2353 and some of the circumstances that I believe in effect compel its enactment.

First of all, I think that most of us are increasingly becoming aware that work has never been more unpredictable. What we are seeing occur in the workplace is increased foreign competition, which in effect is changing the location and the nature of work, it's changing jobs. We are seeing rapid technological shifts, both here and abroad. And we are seeing fundamental demographic shifts within our own work force. We are seeing hundreds of thousands, if not millions of people, surge into the work force, still, even though the baby-boom generation is maturing, to take jobs for the first time.

We are seeing also massive turbulence within our labor markets, much like a body of still water on top—a body of water that appears still on the top; we see underneath that placid surface of our economy great turbulence, great undertows. Over the past 5-years, for example, we have seen 2 million people a year displaced from their jobs simply because their jobs have been permanently disappeared. We see 15 to 20 people a year in our work force that change jobs because of the turbulence, again, within our work force.

We see most of our industries rapidly moving, as much as they can finance it, toward automation and the introduction of new technologies to remain competitive.

As we look to the future, I think that we can see that this pace of change, which is already quick, is likely to accelerate. I think we can also foresee today that the scope of much of this change will widen and that increasingly the United States as an economy will not be able to dominate or control much of this change.

So, indeed, I think that we are seeing the future that is increasingly unknowable. This, however, does not dictate a course of inaction. It dictates, I think, just a contrary. What it really says is, if we cannot know what the future is going to be—and I do not believe in large measure that we can—then it becomes imperative as a society that we have the flexibility to be able to adapt in that future however it unfolds.

And central to having that flexibility is the necessity for our workers to make the adaptations that they must. And to that end, I think that what we are really seeing is a problem that can be desegregated into three parts. One part is going to be the question of preparing people for entry level work. We will continue to have a million to a million-and-a-half people enter the work force each year for at least the next decade.

We have many programs as a society to begin with that challenge. Some are funded by the Department of Education. Many others are funded by State and local governments. And, of course, the Department of Labor deals with many people through the Jobs Training Partnership Act.

The second great challenge that we face is how do we take those who are at work, but in many cases that are changing jobs, and are on the job, how do we ensure that they require training, to make sure that their skills can keep apace with the demands of their jobs? Again, the private sector invests substantial quantities of funds in these tasks. The American Society of Training and Development estimates somewhere in the neighborhood of $30 billion annually.

The challenge I think that we face here is to find ways and means to get the private sector to invest more in this training, particularly the medium- and small-size firms.

And then, of course, there is the final challenge that I alluded to earlier, and that is the question of how as a society do we deal with this issue of displaced workers, which I believe is a potentially socially and politically disruptive problem unless we deal with it in a comprehensive manner.

Mr. Boehlert has been one of the architects and primary advocates of the solution that I think can deal with that effectively: the Individual Training Act—Account Act.

But underlying each of these three challenges is the supposition and in effect, the imperative, that we have a training system in our country that can provide state-of-the-art training. We have a great national resource in our colleges and our community colleges, our technical institutions, and our vocational facilities. But I think that there is a variety of studies that suggest that that resource in many cases is becoming less than what it could or should be because of deterioration in equipment, and as technology changes there is the necessity to improve the skills of the faculty.

So, in essence, if we are to have a flexible work force to meet an uncertain future, it becomes imperative not only to have the types of financing that are available through existing programs in the Department of Labor, in the Department of Education, and State and local governments, and some acts like the Individual Training Account to deal with the displaced worker problem, there is also the necessity to improve and ensure that our educational institutions can offer state-of-the-art training.

At first blush, I would agree with Dr. Moore, that the NSF may not appear to be the most logical agent for this particular task. But I do think on second look that there are some very compelling reasons why NSF would be a logical source to undertake this specific set of tasks. First, it's an agency with high visibility. And I think that the challenge that we face is a challenge that requires high visibility, that of modernizing our institutions that deal with technical training.

Second, NSF has traditionally been an agency that has—when it is assigned a program it indicates that it's a national priority—and certainly I think that this challenge of ensuring that we have a state-of-the-art technical training system must be a national priority.

The third thing that I find very compelling in this act is the fact of the 3-year grants. And that, in essence, I think, is important, because it permits the public institutions to not necessarily worry so much about the annual funding cycle—it will permit them to devise a program and establish some relationships with business and others that are necessary.

The fourth thing that I think is important is that NSF, by necessarily the limitations on fundings, will be able to demonstrate to other agencies, the Federal, and State and local governments, of what is required and how to do it.

One of the things that to me is very frustrating, having spent a good portion of my career in State government, has been the fact to see programs in States such as South Carolina and North Carolina, and Tennessee, and Oklahoma, and others, that can really meet the test of offering state-of-the-art programs and work well with business. But what happens is those lessons that are learned are very rarely transmitted to others. I think this kind of a program can in effect lead the way and exchange lessons.

And then, finally, it really will, I think, put a priority on state-of-the-art training, which is going to be imperative if we are going to meet the challenges.

So in sum, you know, I think very definitely these are the right issues. I think that the amount of money that you are proposing, though small, and probably could—the country could beneficially use more, would be very high leverage use of those moneys and, finally, it is a very modest amount of moneys.

So with that I conclude my testimony.

Mr. **Walgren**. Thank you very much, Dr. Choate.

I want to recognize our colleague, Don Ritter, who had some transportation difficulties, and our constituent with us who has already testified but she has done a—made a beautiful presentation and I want to recognize Congressman Ritter.

Mr. **Ritter**. Thank you, Mr. Chairman. And I would like to apologize to the panel for Colgan Airways and fog. I'm not sure who is most to blame but I think it was mostly Mother Nature today. I regret not being here for the earlier presentations.

And I would just like to say a word about my good friend and constituent, Sheila Korhammer. I think if you ever wanted to describe—characterize somebody as Mrs. or Madam, or Ms., or however you want to put it, Community College, Sheila Korhammer is it. She serves on the board of trustees of our Northampton County Area Community College in Bethlehem, chairman of the instructional services and personnel committee. She is a past president of the Association of Community College Trustees. She is past president of the Pennsylvania Federation of Community College Trustees. She is a past chairman of the Northampton County Area Community College Foundation. And it goes on and on with private sector activities as well, and she is an owner and codirector of a company called Life Plan, which is a very creative management consulting firm providing career counseling, training, and developing services and life planning.

So, Sheila, I welcome you, somewhat belatedly, but, nevertheless, with great enthusiasm.

Mrs. **Korhammer**. Thank you.

Mr. **Ritter**. Thank you, Mr. Chairman.

Mrs. **Korhammer**. Thank you, Congressman. I know the fog well.

Mr. **Walgren**. Thank you, Congressman Ritter.

Well, the—I certainly want to say that I think all the statements that have been made this morning have real truths in them that we have to sort out way through as a committee. And I—I wanted to ask Dr. Moore—we certainly appreciate that we are in a period of rebuilding the education activities of the National Science Foundation and I think we all realize that—that the National Science Foundation as a whole and even—and certainly the educational function is not a big dollar item in the Federal budget. It is a relatively targeted program trying to do a big job. And trying to meet, or fill, a need in our society that cannot be described as met, literally, by any amount of money, probably. So, I am not surprised that the Science Foundation would feel that—that you don't want another big job.

I guess what I am wondering is, we have always sort of relied on the Science Foundation to have some flexibility in it that other more bureaucratic agencies would not. When you spend $830 million on education, you build yourself into a pretty muscle-bound, inflexible cast of bureaucratic limitations that—that is very hard to change its direction and move to areas of real opportunity.

And I have always seen the Science Foundation as sort of like a very aggressive small business that was able to—to—to react specifically and quickly to—to needs in their area, not necessarily have enough effort to meet the need, but to—to certainly do good demonstration and do—create examples of what other parts of society might then pick up and recognize, and pursue.

In your testimony, you are not feeling that—that model educational programs in this area are beyond the mandate of the Science Foundation.

Mr. **Moore**. No.

Mr. **Walgren**. In fact, they really would fit within the—the general mandate, with the caveat that the mandate is very general, is it not? It is a very broad mandate.

Mr. **Moore**. That's correct.

Mr. **Walgren**. But, so—so it would not be inappropriate to—to—to be encouraging the foundation to be interested and active in this area, would it?

Mr. **Moore**. No, not at all. It's certainly within the—within our authorization, within the general mandate of the—of the enabling legislation.

Mr. **Walgren**. And recognizing that there's almost no agency of the Government that we can turn to and say, now, develop 1,300 programs of each in a different place and separate. But certainly it would be—would be within the—the authority and the range of interest of the Science Foundation to—to be developing model programs that would show how we could best meet this need, educationally.

Mr. **Moore**. If—I would say that if NSF has a role, that would be it. And I might just mention, Mr. Chairman, if I may, that that is the general plan, as you know, of our programs in the precollege area, that we are in the process of rebuilding and attempting to stabilize. And I would also just mention the work of a National Science Foundation Committee on Undergraduate Education, that has been in existence since late summer, under the chairmanship of board member Homer Neal, that is charged with examining NSF's activities in undergraduate education across the board, including the 2-year and community colleges.

And that committee has had three public hearings. In fact, Mr. Luskin testified on September 26 at the first of those three hearings. There is another hearing that is—a fourth and final hearing, public hearing, will be held as a matter of coincidence, tomorrow, at NSF. The committee is to complete its work and produce a report by the early part of next year, which—by which I mean approximately February 1986. And—and I'm sure that they will be examining NSF's role in every aspect very closely in the course of this, and that would include the community colleges.

Mr. **Walgren**. And that's along the lines of what I wanted to raise with you, and that is that the Congress has—has, at least in bits and pieces, tried to encourage you in the direction of assessing what can be done with the community colleges. And in fact, in several committee reports that this committee has developed in the last 2 years, we've had specific focus and instruction to the foundation to—to—to prepare a plan for development of a community college program.

Now, that isn't to say that you can implement it, but that we want the attention of the foundation directed in that direction. And the authorization bill that was just passed by the Congress—and we expect to be signed by the President—but we, after several years, have a—a law—a foundation in law—we will have a foundation in law as opposed to the intention of this committee, or the intention of that committee—we will have a foundation in law that will certainly authorize the National Science Foundation to be—to work with the community colleges in pursuit of their education functions.

Mr. **Moore**. Yes, indeed. I understand that.

Mr. **Walgren**. You indicated that—that there are these studies involving the whole range of undergraduate education, and that you expect some development of the role community colleges might play in that in this report that is due in February?

Mr. **Moore**. I expect that to be the case, yes.

Mr. **Walgren**. The—I—my own view in much of this is that we have a masthead on our paper in Pittsburgh, Scripps-Howard, that if you give the people the light, they will find the way. And there is on that masthead a lighthouse which has a beacon coming out of it. And I can really envision us doing something that is not on an overwhelming scale and would not occupy—your whole education budget is $80 million—it would not occupy that in large pertinent part, and yet, because of the standing that the NSF has in the general—in the whole community, I think would—would have great leverage and great influence on what is done with private resources that are contributed to community colleges. I see it more as a function of giving direction than—than performing the delivery, or delivering the service. And I could certainly conceive of a very clear targeted program that could be conducted through the National Science Foundation, certainly within your mandate, not occupying large portions of the education effort, not responsible for delivery, per se, but certainly showing what can be done.

Mr. **Moore**. That, as I say, if there is a role for the Foundation, I think that would be exactly the kind of thing that we would—that we would want to do. I think there is a question—let me just back up one step to the precollege level and try to explain why it is we think we can have an impact there, and it is on the ones that you are mentioning. At the precollege level, our efforts are largely directed at trying to bring two branches, or two kinds of knowledge, to bear on precollege materials and teacher—teacher performance, that the NSF has a comparative advantage with. One, are the materials that come from the sciences themselves, and the fact that we are in very close contact with the research communities in science and engineering that provides us with the latest information, the latest developments in the sciences that are important, to the construction and development of—of outstanding criteria for—curriculums for precollege education.

The other branch of learning that we have access to through our own research programs is that of human cognition and learning, and that part of our research effort is very important also, for improving the curriculums and the teaching and delivery of those curricula to students.

We have become persuaded that at the precollege level there is a very great need to improve the curriculums. And, of course, we can't begin to deliver the actual teaching at the precollege level but we can perform this role of developing model materials, and so forth.

Now, in the areas to which H.R. 2353 is addressed, I think we—we, perhaps out of the fact we simply don't know, but at this point we do not see that the kinds of developments that we are emphasizing, that we think we have an advantage, would be of the same kind of constructive value to the content of these programs. And that is one of the reasons for—for the position that we are taking on the bill.

Now, it may be that the symbolic effort that—the symbolism of NSF's involvement in it is—is enough in itself—and it may be that the substance of these programs does need to be improved in terms of bringing the latest scientific and engineering research results and the latest information about human cognition to bear in them. And if that were the case, then I would see a potential role for the Foundation.

Mr. WALGREN. But at some point the health of the whole scientific effort is—is based on its ability to be implemented and—and if we don't have an educational system that is doing its best in that area, we could fail.

Mr. MOORE. I agree, absolutely.

Mr. WALGREN. And I am pleased that you—that you approach this as the Foundation realizing that this is within the range of the role that the foundation should—should be sensitive to in our system.

Mr. MOORE. No question.

Mr. WALGREN. Mrs. Korhammer, I wondered if you could give us a little understanding of the limitations of the other Federal programs that you see in the community college area. We know there's a lot money going in there. The Education Department does have primary responsibility, truthfully, from the Federal level, traditionally on the Federal level, it's had primary responsibility. We have disputed with the Education Department and this committee between the roles of the Department of Education and the department of NSF, and the math/science education efforts that we have tried to create in the last several years, and certainly we do look primarily to the Education Department.

Can you give us any insight as to the limitations that you have felt in that area, and frustrations that you may have come across?

Mrs. **Korhammer**. I think two things have happened. One, the community colleges have grown up after many of these programs were already in place. And the other thing that we've had to contend with is increasing our credibility within the educational system. Our newness was difficult to—was understood with difficulty up here on the Hill. In fact, I remember in 1978, coming up to talk to some of my Pennsylvania legislators, and the question was always what is a community college? I mean, it was—we weren't understood as the force—the potential of the force that we could have in the educational system. So I think that's why when it comes—the debate for the funding, the moneys, the community college has to work very hard to get the little pieces that we've gotten so far.

Mr. **Walgren**. I see.

But hearing Dr. Moore said—say, look, we are spending $83 million through the Department of Education essentially in—in areas of vocational training and there's obviously this large amount spent by private industry and yet your feeling is that essentially the community colleges have a tough participating in that.

Mrs. **Korhammer**. Well, that has a long history of being a secondary program. And again, I think it's the community colleges—even locally, community colleges vie—those of us who are sponsored by school districts, there's a mindset that the main mission is K through 12. And the community colleges are meeting with some resistance with the people who do fund us through school districts. And I think there's a halo effect in all of this.

Mr. **Walgren**. I see.

Mrs. **Korhammer**. Now, you will have to understand also that as a lay trustee and not a professional educator, I do have to turn to the experts that help us to make the decisions that we do make.

Mr. **Walgren**. So in a sense, those moneys really miss the whole population that's out of high school, and whatever their needs are, those—those moneys are, by and large, going into secondary levels. And, of course, there's great needs at secondary levels as the NSF is recognizing and focusing their programs on that area. But it certainly is not reaching a great part of our educational system at that point.

Mrs. **Korhammer**. Absolutely. Especially the—there's the competition between your secondary vocational technical and your 2-year vocational-technical institutions also for the moneys.

Mr. **Walgren**. I am intrigued with the idea that—as Dr. Moore says—you have the private sector putting in, and Dr. Choate mentioned it also, the private sector putting in a tremendous amount of money in training efforts in-house, I am sure, by and large, about $3.5 billion.

It strikes me that—that if we could focus their contribution in ways that they would be interested in focusing it, that you may be able to develop some very strong programs that would not otherwise develop. I think, for example, it's one thing for a private industry to—to try to deliver some retraining within its own four walls; it's another for that same private industry to identify with the community and be excited about participating in a retraining program that is essentially a community-sponsored program rather than a—simply a company retraining effort for that company alone.

Mrs. **KORHAMMER.** Absolutely. In fact, that's one of the things that's happening within community colleges right now. With so many of our business and industry meeting economic problems, they are closing down their own internal training programs and turning to the community colleges because the training can be obtained in a more cost-effective way.

The second thing that's happening, which is very important, is that community colleges cannot afford all of the state-of-the-art equipment that is needed to provide the training, so these partnerships are built whereby the community colleges can share in the use of the—the equipment that the companies have in the training of their employees. So the partnerships that are growing are excellent.

Mr. **WALGREN.** This, to me, is one of the great potentials of this kind of an effort—if we could get NSF, or participating in this, as I think it would draw, in a sense, on the—the spirit of—of community volunteerism. I think you are going to see companies volunteering their contribution because it inures to the community when the community really has a need, if they have confidence in the program in a way that they would not—that could not necessarily be drawn out for them otherwise. So I think there's certainly some great potential in that and I do—I do understand that the community colleges have worked on those partnerships to the best they could.

But would this be a—an interesting feather to have in what you offer to the communities if we could get these kind of programs going.

Mrs. **KORHAMMER.** Absolutely. And I think the thing that would make it work is that the—the legislation does demand matching funds, which even can include this industry. And I think—recently in Pennsylvania, a lot of the customized job training programs that have come into certain businesses have been because of the community colleges that have, you know, have worked for them. This H.R. 2353 would offer even a better avenue to get at the technology that's needed by our business and industry.

I worked on the advisory commission that was setting up a national telecommunication advisory education council, and the biggest cry from that group was that technology is so far ahead of the technicians available, that they are worried that can the gap ever be closed. And I think this legislation is a good step forward toward filling that need.

Mr. **WALGREN.** I appreciate your having laid out in your testimony the recommendations of the President's Commission on Competitiveness, and particularly that we should be looking for the macrostrategies that would—that would—that would encourage employer investment in employee training. If there's any seeds that we can plant in that area, I think we ought to be about planting and using every tool that we have available to us, provided it doesn't destroy other goals that an agency like the Science Foundation may be in pursuit of as well.

Well, let me recognize Mr. Boehlert at this point.

Mr. **Boehlert**. Thank you, Mr. Chairman. I have a statement that I ask permission be inserted in the record following your opening remarks.

Mr. **Walgren**. Without objection.

Mr. **Boehlert**. Mr. Chairman, I think that deficit reduction is probably on everyone's priority list and it's probably No. 1 in the Congress in terms of problems with which we must deal effectively. And there are probably 435 different versions of how best to deal with it. I want you to know that tied for that on my priority list is solving the problem—the twin problems—of unemployment and underemployment.

So I am enamored with this concept. We need to train and retrain technical personnel. I think $80 million is a very modest funding level, even given our current conditions, because the return would be many times that number if we achieve what we want to achieve. But I, like Dr. Moore, have some genuine concern about the direction in which we are proceeding. Given the fact that we already have a number of programs designed to train and retrain people, we already have other agencies of the Federal Government that have that mandate. Given that, and also given my deep and abiding interest in community colleges, and my concern that NSF doesn't pay enough attention to community colleges, I have the following questions.

No. 1, Dr. Moore, when is NSF going to get energized to bring community colleges into the family of the education community that you are deeply concerned with, committed to, and responsive to?

And then I would like you to get a little more specific about the number of programs that NSF has for which community colleges are eligible. And following that, what kind of request are you getting these days from community colleges?

I have talked as recently as this morning with a highly respected president of a community college who sort of shook his head when I mentioned NSF, and he said, oh, the paper work, and the bureaucracy is mindboggling, and we just can't even hope to get involved in it.

So, could you address all of that?

Mr. **Moore**. Well——

Mr. **Boehlert**. It's a tall order.

Mr. **Moore**. I'll try. Well, No. 1, I would simply point out that individual faculty members at community colleges are eligible to apply for our programs. And, indeed, our programs in the precollege area are not restricted either by law or our own publications to the precollege—to precollege institutions. In other words, there's nothing that prevents a community college that is interested in developing materials from applying to that program. It's a competitive program.

Mr. **Boehlert**. How many are participating, would you say? And what percentage would that—a percent of the whole?

Mr. **Moore**. At this point I don't think we have any.

Mr. **Boehlert**. That's my concern.

Mr. **Moore**. I don't think there are any participating in that.

But as—and in terms of our general programs, they are open to all comers. Any—anyone can make application. I agree that our paper work presents something of a barrier, not only to people in the community colleges but also to people in the 4-year colleges and in the research universities. It's a—that's something that we are trying to deal with, we are trying to simplify our procedures and to bring them into the—bring them closer to the electronic age in which we live. It's a—it's a problem that requires a good deal of attention, and it's getting a good deal of attention.

As far as the first question about when we are going to be energized into including the community colleges , I guess I don't exactly know what you mean by energizing. I—the only thing I can point to at the moment that—that would reflect that kind of concern is the NSB committee that I mentioned earlier, that is looking into the general area of undergraduate education, including the 2-year community——

Mr. **Boehlert**. When do you expect to have a report on that?

Mr. **Moore**. In February, I believe.

Mr. **Boehlert**. What are you doing, for example, with instrumentation and equipment moneys? Are community colleges sharing?

Mr. **Moore**. Well, we—our program for fiscal 1985 and for fiscal 1986 is $5 million in the college science instruction program. Some, which I will agree, is miniscule, compared to the need for instrumentation throughout—throughout—throughout the educational enterprise. That $5 million came out of the appropriations bill for 1985 which specified that it be for 4-year colleges. The 1986 appropriations language does not contain that particular specification but we are proceeding on the assumption that that's the intent, that the intent remains that that money be used for the 4-year colleges.

We have discussed internally the possibility of extending that to the 2-year colleges. The problem is we can only fund—I forgot now—I think it's about 1 in 8 proposals that come to us—or maybe it's—I think that's right—1 in 8 proposals from the 4-year colleges for that $5 million.

It's been a very, very popular program with the 4-year institutions. And by the way, it has an additional component which I would like to mention. It is not merely providing instruments to the colleges. This is a com—it's a competitive—it's a competitive grant program, and the competition is focused not only on the use of the instrument in the classroom, but also on the development of materials to accompany the use of that instrument. And a major part of the purposes is to develop instructional materials that could be disseminated more broadly and used in other—in other laboratories in, not only the 4-year institutions but also 2-year institutions .

Mr. **Boehlert**. Let me follow up if I may, Dr. Moore. Rather than proceeding with this as envisioned in the preamble to the legislation and giving NSF an entire new responsibility for our program administration and all that goes with it, would you be receptive to the proposals that we use an existing program that might be in operation, for example, within the Department of Labor or within the Department of Commerce rather than creating an entire new program, and have an arrangement with NSF where you would develop the model for the training programs?

Is that something that——

Mr. **Moore**. Well, that's a——

Mr. **Boehlert** [continuing]. Would be more practical from your point of view?

Mr. **Moore**. It would certainly be more practical from our point of view, and that would be a possibility that we could—we could explore. We have not—there has not been any discussion of that kind of an approach at the foundation, to my knowledge—it may have.

Mr. **Boehlert**. Would you suggest to me that we ought to explore that further?

Mr. **Moore**. As a committee? I—I wouldn't want to——

Mr. **Boehlert**. Well, now, the point I am driving at is we already have so many programs on the books right now to deal with training and retraining and we don't have enough money. I am always willing to support more funding because I think it is clearly in the national interest to get people employed who are unemployed, and upgrade skills of those who are underemployed, because our investment in these efforts return manyfold to the country benefits.

But rather than creating an entirely new program within NSF, go with an existing program and have the working relationship within NSF. How about Dr. Choate? Do you have a response to that? I know you said initially you sort of were skeptical about the proposal, and the more you thought of it, the more you were enamored with the NSF approach. But I think in terms—we had a field hearing in Pennsylvania. Just let me give you an example. JTPA is still in its infancy. It's a program I strongly support. I know you do, too. And yet, I was surprised, almost shocked to find out at this field hearing in Pennsylvania about the underutilization of the Job Training Partnership Act in the State of Pennsylvania; whereas, in the State of New York, where I—we are using it very effectively—private industry, councils, working with community colleges to set up training programs, to address the clientele that we are both interested in addressing, utilizing the very high quality community college.

So, what I am saying is—level a little bit if you will, Dr. Choate.

Mr. **Choate**. Well, my own thoughts on other departments, when one thinks about the departments——

Mr. **Boehlert**. Is your mike on, because you——

Mr. **Choate**. Yes, I need all——

Mr. **Boehlert**. I always like to hear everything you say.

Mr. **Choate**. Thank you.

When one takes a look at the Department of Labor programs to the Job—JTPA, I think what one finds is that they are focused very heavily on certain clientele groups: economically and culturally disadvantaged, youth, a small component—title III, of course, for the Displaced Worker Program. And I think that their primary interest is that essentially of financing the training of the individual, less that of improving the quality of the educational institution itself. When one takes a look back at the Department of Education, there are perhaps several programs under which such an activity could be located.

I think that part of the compelling logic here in this particular act is to raise to very high visible national attention the imperative for all of our training to say that it's—it's essential, that we take our training institutions and bring them state of the art. And it would seem to me that there—if one is sorting out responsibilities that there is a compelling national purpose to the—for the Federal Government above and above any of its other programs to assure that training which is offered is state of the art and that the institutions have the capacity to do that.

I think what we are talking about are some marginal amounts of money right at the top, just taking and leveraging what the States and locals and other Federal programs to do. So it would seem to me that if it could go into another department, and obviously it probably could in the Department of Education, then the question would be: Would it receive the high priority national attention that NSF would bring to it? Or if it is to be structured that you are suggesting, how does an agency like the NSF become a participant to ensure that high visible national attention?

Mr. **Boehlert**. Well, I am thinking in terms of as I exchanged thoughts with Dr. Moore about perhaps NSF developing the model in consultation with another agency already operating in existing programs.

See, part of the problem we have here is that we create so many new programs that we so diffuse the dollars that they don't have any significant impact in one program area. But if we narrowed our focus and had a couple of agencies dealing very effectively with a couple of programs rather than 20 agencies with 20 programs, for the same dollar amount we would get a much bigger bang for the buck, and I like NSF working in consultation.

I think of one of my favorite programs again, Trade Adjustment Assistance. I would imagine the NSF could develop a very effective model that could be utilized as we take these people that are eligible for Trade Adjustment Assistance to train and retrain them in technical areas.

And I also think of a program that we are closely identified with—Mr. Chairman, I would like the record to know they have a partnership with Dr. Choate and my colleague from the State of Illinois, Mr. Durbin, we are—Mr. Durbin and I are the coauthors of the individual training account concept which was initially developed by Dr. Choate. And we now have 88 cosponsors in the House, and we are moving with that.

But if we get where we want to get with that program, and then suddenly we have across America displaced workers who have a voucher and an eligibility to use up to $4,000 in individual training account moneys to get training in skilled areas, I am wondering if NSF is the agency that should be administering a program that provides the training we want these people to have using their ITA voucher.

And I am not sure that's the proper role for NSF.

Mr. **Choate**. I think I agree with you the way that you constructed that. It seems to me that ultimately this—these training programs are going to have to be offered by, you know, these individual institutions. The challenge is, it seems, whether it's NSF or the Department of Education, or some other agency, is for the Federal Government to ensure that these training institutions can be state of the art. And that there is the assurance that the technologies that they are using are indeed state of the art, that they have ways to develop these relationships with business in the exchange programs; that they can find creative ways on equipment use such as the equipment pools—State of Oklahoma, and South Carolina uses. And so the real challenge, it seems, whether it's NSF or Education, or some other department, is for the Federal Government to create a vehicle and a means to take a small amount of moneys and use it to assist the States and the communities to make sure that when some displaced worker, or any other worker, walks in, that they can be guaranteed that they are not going to get obsolete skills.

Now, as to the question of, you know, the administrative structure, I think that really becomes secondary.

But I think that NSF, because of its prestige, and because of the expertise that it has, and because of the strong linkages that it has with the industrial and business community, really does offer a lot in such a program, whether it administers the program or whether it is a—has—works with someone else. I mean—so, their involvement, and perhaps directly, it seems to me, has a lot of compelling logic to it.

Mr. **Boehlert**. Thank you very much.

And the only further thing I would add, Mr. Chairman, before yielding back the balance of my time, is to suggest to Mrs. Korhammer, that you take a good look at the Job Training Partnership Act, which I think is being used very effectively, using the community colleges and other areas of the country. And I had the impression from one of our field hearings in Pittsburgh that the State of Pennsylvania is not taking maximum advantage of the Job Training Partnership Act. I am a great fan of community colleges, believe me, I think they are a strong component of the higher educational system.

Mrs. **Korhammer**. I am happy to say that my college is one of the colleges taking great advantage of that—that program. We regretted that we were given one grant of over a million dollars that we had to give back, or at least——

Mr. **Boehlert**. That hurt, I betcha.

Mrs. **Korhammer**. That was ZBIC, and they did not go ahead with a building program and bringing in the workers. So we relinquished some, if not all of that one. But we've had several successful programs using those funds.

Mr. **Boehlert**. Thank you. Thank you, Mr. Chairman.

Mr. **Walgren**. Thank you, Mr. Boehlert.

Mr. Brown.

Mr. **Brown**. Mr. Chairman, I don't have any questions. I have a few comments, thoughts, that I would like to propose. The tendency in this committee from the beginning, as Dr. Moore well knows, probably, is to seek a broader involvement of NSF than NSF generally thought was desirable, in areas such as education, applied research, and things of that sort. And there are reasons both for the committee's interest in doing this and for the foundation's resisting it. And there's no point in finding fault with each other because of that.

The committee has the view that our effort to seek scientific, technological, economic progress, and superiority is an intertwined activity which requires that we establishing—establish a large number of linkages in—between the various sectors of the society, and that we focus on improving the quality of each of the components in every way possible.

It seems to be that that's one of the advantages which compared with such as the Japanese have—have been able to exploit over our system. Our ability to improve the productivity of a basic industry such as steel, for example, requires that—that we be able to scrap old technologies, old ways of doing things, and embark on new ones. And this displaces people, generally. And the superiority that we have historically had, and should have, is the ability to rapidly adjust to reallocate capital and to reallocate people in ways which make more constructive use of their abilities for the benefit of the whole society.

In this sense, the ability to have in place a high quality program for the training of technical workers is a very key ingredient in this whole process, both in training them and retraining them as technologies tend to reshape themselves over time. We are going to have to train people who are accustomed to dealing with copper wires, to deal with optical fibers, for example—a lot of things of that sort. And it's economical and most productive in using the resources of a society to do that in a fashion which minimizes waste and which doesn't throw usable people and usable resources on the scrap heap. And this is the reason for the—for the kind of approach that the chairman is trying to make with this bill.

And I am sure that the committee recognizes that it's not the NSF's role to restructure American society or any grandiose things like that, but we do feel that there should be, within the management of the NSF, a comprehension of the importance of these linkages and the capability to provide guidance and wisdom, and to establish models, prototypes, that will be useful in achieving a wider spread dissemination of some of the new capabilities that we need to have that benefit science, research, technology, industry, and in general, the society as a whole.

Now, that's just a prelude to asking you, if I may, why can't we get more of that thinking in the National Science Foundation, and why can't that be incorporated in—in developments such as, we'll say, the engineering research centers, or the computer centers? Those operations are not going to work unless you have a high quality research institution which has a program, not only of research, but of bringing in the best qualified people to do that research, which is linked with the industry of the region in such a fashion as to meet the needs, the engineering research needs, of the region, and which is linked with the educational resources of the region, including the community colleges, in providing the kind of training, retraining, upgrading, that's necessary in order to cope with the challenges of a new generation of advanced engineering?

Why couldn't that be a component in the development of your engineering research centers, for example, that they demonstrate the capability to link—as I think you are already trying to do—with the private industrial base of the region, broaden that to include all components of the educational resources of the region, including the elementary, secondary, and community college levels, in such a fashion that you create a prototype of what is necessary to demonstrate both improved engineering research, but improved capability of utilizing human resources for the conduct of that engineering research?

Is that a—such a startling idea that it couldn't have occurred to some of the people over there?

Mr. **Moore**. Well, it's only slightly startling. But I—I certainly would agree with you about the importance of the linkages of all different kinds. And I think that there is a very, very clear awareness of the importance of developing appropriate, useful linkages wherever we can. As you've pointed out, that's certainly true of the—of the ERC's themselves, where perhaps the linkages could be pressed further than they have been to date, but linkages among the—between the NSF, between the universities, and between and including industry, are a critical part of the whole concept.

And you mentioned the super computer centers, and that is true in that case as well. Forging the linkages with the industrial participants in that—in that particular area has been of great importance as well. And I think it's also true that pre-college—in the pre-college programs where we are working, again, the important elements there are the linkage between the science community, on the one hand, producing the scientific results, that are incorporated into the new materials, the teaching programs, and so forth, that teachers themselves and their local—their local communities, in trying our best to leverage what our very restricted funds can do to the greatest extent possible.

Your suggestion about broadening the concept of the ERC's, I said, is only slightly startling—it is a new one. I think that it's—at least new to me—something that we could—we could give some thought to. I don't know if it would work or not. I don't know, you see, whether doing that would dilute the effort, the primary effort, of the ERC's in a way that would make them less effective in—

Mr. **Brown**. Yeah, and I recognize it is a very small amount of money going into the ERC's, but conceivably if we could provide additional resources for a program of broadening those linkages of a type that's represented by this legislation, it might be that we could improve both the—the nature of the ERC's as well as providing a model that has much broader application. Of course, again, it's not just ERC's we are concerned. We should be looking for, we'll say, our great Federal laboratory system to be thinking in terms of these kinds of linkages. They are now, generally speaking, linked with some university or other, or some group of universities. But it wouldn't hurt them to think in terms of linking with—as we are beginning to see in some cases like Dr. Keyworth is proposing in the steel work—steel industry initiative—linking with the needs of some regional or even national industrial component and with the educational resources of the region below the college level in order to enhance the overall effectiveness of what we are trying to do.

Mr. **Moore**. Well, I certainly agree with the view—your view, that—that some thinking could usefully be applied to the—to how the national labs fit into this picture. You may know about—there are, I think, some efforts at some of the national labs to establish some kinds of links. You probably know about the Fermi Lab Program involving high school students in the Chicago area that I think is a good example.

Mr. **Brown**. Well, I'm sort of meandering on here to indicate the frustration that we feel looking at the problems that faces us as a nation, and then a multitude of initiatives that are required to face up to, that if we are going to really achieve progress in—in our competitiveness, and our ability to develop improved productivity and quality of production in this Nation.

And we look at these things in terms of what contribution each of these different initiatives can make, but we are also trying to see how they can all be linked together in some comprehensive way.

I have no further sermons.

Mr. **Walgren**. Thank you, Mr. Brown.

One thought. Mr. Brown raises the difficulty of—of knowing that the people within the Science Foundation are thinking creatively in these areas, and in particular, since they are in a position of defending a relatively narrow role, would not instinctively look out to—to broaden the activity that the committee—or that the Foundation might really constructively engage in.

My concern about this National Science Board study is, is that folks who really haven't grappled with what community colleges may or may not contribute, or even grappled with the training needs that Dr. Choate raises, will meet and say, well, you know, gosh, our plate's pretty full, we're doing this, this, and this, and that will be that.

So, I guess I'm asking, Dr. Moore, if there isn't some way that you could—could let those people involved in that review know how interested this committee in—in the community colleges and the role that they might play in this, so that we know that the people who we have to rely on to give the best thought to this, giving it some—some motivated thought, and some thought that's broad enough that it might encompass encouraging this kind of thing to happen.

Mr. **Moore**. I made a note as you were talking. As it happened, I had made a note previously—

Mr. **Walgren**. Good.

Mr. **Moore** [continuing]. To the same—to the same effect.

Mr. **Walgren**. One concern I have about the whole scientific establishment is that it—it tends to be relatively finite and limited in talking to itself is the nature of science, is to read your own journals, I guess. And—and I really hope that the people who are in the roles of advising the Foundation through the board look at that broader social role as creatively as they can.

I wanted to ask Dr. Choate, you mentioned that—you give the background of the changes we can anticipate in our economy and the training that will be required for that.

Can you tell us anything about what other countries are now doing in this range of technician training? What are we up against in terms of the technician training in places like Japan and other countries that are—that are more focused on this than we are as a Government?

Mr. **Choate**. I have taken a look and have gone and taken a look at the programs in Germany and Sweden, which are two of the primary technological competitors in Europe. And what you find there is with their apprenticeship and their Advanced Training Programs and in a series of business/Government relationships, is that in many ways I think they are exceeding us, because their apprenticeship programs really do prepare people in technician-type areas.

In Sweden, for example, it was truly amazing. Their technical institutes are using equipment that in many cases is even superior to what's found in industry in Sweden, and they will announce it. Just where in the United States we train, in many case, on obsolete equipment vis-a-vis—

Mr. **Walgren**. And how does that happen? Where do they—how does the institute windup with that——

Mr. **Choate**. The Government finances it. The Government provides the training. I mean, it's a national priority to have their people with state-of-the-art training. And their industry and Government and the manufacturers of the equipment work together.

When one goes into China and into Japan, what one also finds is that their manufacturers of equipment and the schools, again, are operating with state-of-the-art equipment. And in fact what you are now finding throughout Southeast Asia is Government and industry of Japan, machine tools and other equipment, are giving state-of-the-art educational and training equipment for the very obvious reason they want people aware and using their type of equipment so later on that they will order that equipment.

This is one of the reasons why we are going to increasingly face, I think, formidable competition in—and it goes back to the base of my opening comments, why we must meet that challenge.

Mr. **Boehlert**. Dr. Choate, let me ask you this. Are we approaching the day when in our manufacturing sector here in the United States there no longer will be a place for the unskilled worker? Now, I'm not talking about the untrained worker because a lot of jobs on assemblylines you give 3 hours or half a day of training, the person can go on the assembly tomorrow and be a productive employee. But things are changing. It's very dynamic.

Are we approaching that day?

Mr. **Choate**. Oh, I think we are going to see that day. And I think we are going to see it over the next several years. And the Florida orange growers used to have a slogan that was that orange juice is just not for kids anymore. And I think we can apply that to education and training, that education and training and retraining is just not going to be for kids anymore. And it becomes particularly important because of the peculiar demographic composition of our work force. Eighty-five percent of the workers in this country in the year 2001 are already adults and most are at work. And if Joseph Schumpater was correct in 1940 when he said capitalism in the market system is a process of creative destruction, it's even more so today, 45 years later.

If we are going to compete, as Mr. Brown is suggesting, it's going to be absolutely necessary for us to scrap whole generations of technologies and perhaps be prepared to do it on a continuing basis every 4 or 5 years. And it's just not—just for in—just not for technicians, I might also add. What TRW finds is that many of our engineers, after 5 or 7 years out of college, their skills are increasingly outdated and obsolete and it becomes necessary for us to send them back to do upgrading training.

So I think that what we face is the con—is a process of continuous training and retraining. Our challenge is how does business and industry work together so that people do not—are not ambiguous about taking this training. They just realize this is a regular part of their jobs and part of their careers henceforth. And how do we assure them that once they take that training that it's going to be absolutely state-of-the art? I mean, I—I think it's an essential element if we are going to make the adaptations that we must to compete.

Mr. **Boehlert**. How about a plug for your forthcoming book? What is the name of that book? [Laughter.]

Mr. **Choate**. An author always likes that. It's called "The High Flex Society."

Mr. **Boehlert**. "The High Flex Society," and it will be available when?

Mr. **Choate**. Prepared for a certain future.

Mr. **Boehlert**. Thank you very much.

Mr. **Choate**. Thank you.

Mr. **Walgren**. Well, on behalf of the committee let me thank all of you for being a resource to us. We appreciate the contribution you have made to our record and I appreciate all of you having joined us this morning. Thank you.

Mr. **Walgren**. The second panel is made up of Dr. James Owen, the president of Tricities State Technical Institute, from Blountville, TN; Dr. Richard Anderson, the district director of the Waukesha County Technical Institute of Pewaukee, WI; Dr. Michael Schafer, the president of the Mohawk Valley Community College in Utica, NY, and Dr. Andrew Korim, Community College of Allegheny County in Pittsburgh, PA.

Folks, if you would come forward and join us. Written statements, as I have said before, will be made part of the record in whatever fullness you desire to submit them, and please feel free to—to focus on the points that you will want to highlight and feel are most significant. Let's go through the panel in that order and if you have a time problem individually—I understand some might have other commitments and we have gone on with the first panel—we will catch up to you in writing if we have things we would like to develop with you.

So, let's start then with Dr. Owen.

STATEMENTS OF H. JAMES OWEN, PRESIDENT, TRICITIES STATE TECHNICAL INSTITUTE, BLOUNTVILLE, TN; RICHARD T. ANDERSON, DISTRICT DIRECTOR, WAUKESHA COUNTY TECHNICAL INSTITUTE, PEWAUKEE, WI; MICHAEL I. SCHAFER, PRESIDENT, MOHAWK VALLEY COMMUNITY COLLEGE, UTICA, NY; AND ANDREW S. KORIM, VICE PRESIDENT FOR INSTITUTIONAL ADVANCEMENT, COMMUNITY COLLEGE OF ALLEGHENY COUNTY, PITTSBURGH, PA

Mr. **Owen**. Mr. Chairman, it's a pleasure to have the opportunity to lead off the second panel this morning. And those of us in the second panel were quite interested in your comments as you discussed with the first panel—I think that was extremely on target.

My name is Dr. H. James Owen, and I am president of Tricities State Tech which is located in the Bristol-Kingsport-Johnson City area of upper east Tennessee. It is one of the most industrialized areas of the State of Tennessee. We have a large employer—Tennessee Eastman Co.—which employs 12,500 persons in our district, which is Tennessee's largest employer, and we have also two TRW plants, a Sperry, TX Instruments, Raytheon, and a large number of high-tech firms. I am president also this year of the AACJC and National Council for Occupational Education.

We have several important initiatives that we are concerned with this year and those include the support of a national human and economic resource development policy, which we find also is important to this committee. Also, our council is interested in strengthening the associate degree which—particularly the associate of applied science degree, which is very significant in the terms of the training of technicians. And we appreciated the—the comments of the chairman with regard to the National Science Foundation and its role in this.

Also, we are interested in supporting most secondary occupational education.

Two past presidents of our Council, Dr. Andrew Korim, who is on the panel this morning, and Dr. Don Garrison, of Tricounty Tech, were early leaders in the development of the Walgren bill that is before us today, and we support H.R. 2353 for two main reason: One, because it focuses on technical institutes and community colleges in their role of training technicians. And it also focuses on the associate degree as a principal and preferred approach for training technicians.

One of the things I did in preparing to come here this morning was to look over the members of the subcommittee, Mr. Chairman, and certainly the Community College of Allegheny County represented in your district; Mr. Lundine's area of Jamestown Community College; Mr. Brown and Mr. Wirth and Mr. Mineta from California and Colorado and their strong systems of community colleges; Mr. Bruce, Illinois Valley Community College, which is one of the leading community colleges in Illinois; Mr. Valentine with Nash Tech and Durham Tech in the Research Triangle area; Mr. Boehlert with Mohawk Valley Community College; Mr. Ritter with the Northampton County Area Community College; Mr. Henry with a strong program in Grand Rapids; and Mr. Cobey with the Research Triangle of Wake Tech and Durham Tech and Asheville—Randolph Tech. Certainly the strength of—of community colleges and technical institutes in our country are represented strongly by the membership of your committee, which is impressive to me.

With regard to the technician shortage, the surveys are fairly extensive in terms of where we are likely to be in the next three, four, five years in terms of technician training. Surveys have been conducted by many agencies to indicate this. Certainly in the areas of electronics, robotics, computer aided design, drafting, computer aided manufacturing, we are going to need tremendous changes, as Mr. Choate has indicated in his comments, in the next several years.

As I look at the training that we're doing in our electronics engineering technology and our computer-aided drafting programs, for example, in our 2-year institutions across the country, we are doing things at the associate degree level that the engineering schools 15 and 20 years weren't doing, or didn't exist. And that just shows what's happened in terms of the level of technical training.

I think, also, it was mentioned earlier about JTPA, for example, which in our State of Tennessee and in other States, community colleges and technical institutes are working very effectively with. The focus on that, however, is more for short cycle training and for dislocated workers which we are working hard at. But I think the focus in H.R. 2353 is more toward the associate degree, more towards training the—the full technician.

I was interested in a study recently by the Upjohn Institute which was looking at robotics technicians and they said that anywhere from 32 to 64,000 new jobs would be created in the robot manufacturing area and that these would require principally two years of technical training in community and technical colleges. And I think that's just right in line with what we are doing.

Our council did a survey several years ago—now it was 2 years ago—in which we looked at 353 industries in 20 metropolitan areas. And we found that there is a tremendous need for technicians and that the support of technicians to engineers is very significant. Dr. Korim will be commenting on this in his presentation about the number of technicians that are really needed to support one engineer.

We found in our study of 353 industries that 37 percent of the industries that we surveyed indicated that the associate degree was the minimum preferred educational requirement for technicians in their firm. And this study, I did send a copy to your committee with my materials which I sent so that that study would be available to you.

I think one of the main questions really is with regard to the Walgren bill, why are technical and community colleges so significant. I think that we are so perfectly positioned in the structure of things to deliver on what the bill calls for. We are national in scope. We are experienced in short-cycle training. We have strong associate degree programs. We have strong foundations which are responsible for resouce development at the local level. We can raise the funding that is required to match in the non-Federal portion. We have close connections with actual business and industry. We do not tend to be in an ivory tower. We tend to strongly work with local business and industry to identify their needs and to meet their needs.

Another initiative that our council is working on with AACJC is strengthening the associate of applied science degree which tends to be the leading associate degree in terms of training technicians.

We are emphasizing strong math and science requirements as well as strong technical skills. And this policy of excellence in the associate of applied science degree is in the process of going through the national level with the American Association of Community and Junior Colleges board to seek support for this.

Another initiative that AACJC has worked on which identifies another component that Mrs. Korhammer mentioned earlier was partnerships. We have a relatively large grant, as grants go, from the Sears, Roebuck Foundation to the "Keeping America Working" project of AACJC, approximately $800,000 or $900,000. And through national competition, some 20 or 30 projects were identified nationally to partnership with business, industry, government and education at the local level. These are in process now and will be closely watched as this year goes along.

And I have indicated in my testimony in the printed record some instances that were shown by the "Keeping America Working" project as they surveyed institutions across the country that were interested in this type of work and there are a lot of things going on. There are a lot of partnerships with business and industry. There are a tremendous number of courses that are being offered for existing employees. There are all types of flexible schedules being developed—weekends, evenings, summers, all types and manner of things to meet the needs of training.

We all know that studies indicate that industry spends from—anywhere from $30 to $40 billion a year in training. And I think the—the item in this bill is a very small amount of money, can be leveraged at the local level to raise money for equipment and to really develop some exemplary programs.

Another point that I wanted to make, which is outlined in the testimony, is another initiative of AACJC and ACCT this year, is to focus on the 2 plus 2 Tech-Prep Associate Degree Program. And what that is designed to do is to develop in grades 11 and 12 a continuous program leading to the associate degree that could be developed at the local level to meet local needs.

One of the areas that would tie into this that has been developed in the last couple of years is a project called the principles of technology, which focuses on a wide variety of math, science, and physics-type principle which can strengthened the program in high school and then lead on into a strong associate degree program at the community college and technical institute.

I think one important overall thing, Mr. Chairman, that we should mentioned about H.R. 2353 is, I think it's an important piece in leading to a overall human resources development program for our country. I think the comments that you made and that Mr. Choate made about the National Science Foundation are very good. I think the National Science Foundation has not worked cooperatively in the past with 2-year colleges very much as the discussion this morning tended to show. And I think this would be an excellent opportunity for the National Science Foundation to work cooperatively with 2-year institutions in what could be a model program on a national basis.

The AACJC National Council for Occupational Education is pleased to be able to give an overview of H.R. 2353 and we support the bill and support the purposes as outlined in the bill. And we thank you for the invitation to speak briefly today on this vital topic for our country.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Owen follows:]

TESTIMONY
on
H.R. 2353

Before

Subcommittee on Science, Research and Technology
Committee on Science and Technology
U.S. House of Representatives

By

Dr. H. James Owen, President
Tri-Cities State Technical Institute
Blountville, Tennessee

and

1985-86 President, American Association
of Community and Junior Colleges

National Council for Occupational Education

Presented

November 19, 1985

Room 2318
Rayburn House Office Building

Washington, D.C.

Testimony of Dr. H. James Owen, President
Tri-Cities State Technical Institute (Tennessee)
and President of the American Association of
Community and Junior Colleges, National
Council for Occupational Education

Mr. Chairman and Members of the Subcommittee on Science, Research and Technology, I am Dr. H. James Owen, President of Tri-Cities State Tech in Tennessee. On behalf of the AACJC National Council for Occupational Education, of which I serve as 1985-86 President, we are pleased to provide comments regarding H.R. 2353, the National Advanced Technician Training Act.

National Council for Occupational Education

The National Council for Occupational Education is an affiliated council of the American Association of Community and Junior Colleges with approximately 350 members representing community, technical and junior colleges across the nation. Our goals for 1985-86 include the following:

a) developing strategies in support of a national human and economic resource development policy

b) developing criteria to strengthen the Associate in Applied Science degree

c) supporting legislation enhancing postsecondary occupational education

Two past presidents of our National Council for Occupational Education, Dr. Andrew Korim of the Community College of Alleghany County (PA) and Dr. Don C. Garrison of Tri-County Technical College (SC), were instrumental in the early development of H.R. 2353 and its predecessors. NCOE supports H.R. 2353 for two main reasons:

1) H.R. 2353 places a focus on technical and community colleges and their role in training technicians for the American work place;

2) H.R. 2353 highlights the associate degree as the principle and preferred approach to the training of technicians

The Technician Shortage

In its May, 1981 report, the American Electronics Association (AEA) projected needs across the board for technicians trained in the broad field of electronics. This report entitled "Technical Employment Projections of Professionals and Paraprofessionals: 1981-1983-1985" was cited in the AACJC concept paper entitled "Putting America Back to Work." In attempting to draw attention to programs to target for inclusion in any new national employment and training legislation, "Putting America Back to Work" noted several skill shortage areas outlined in the 1981 AEA projections.

In an effort to update its 1981 projections, the American Electronics Association surveyed 815 companies representing one-third of the electronics industry during 1983. This survey led to a report entitled "Technical Employment Projections, 1983-87." The results indicated that the electronics industry will need over 60 percent more technicians by 1987 than are employed in 1983. The industry indicates that more than 115,000 new technician jobs will open up by 1987 in addition to any needed replacements for workers lost due to attrition. It is important to note that these technicians need skills which are now provided by existing community and technical college programs. While the largest numerical growth will be in both the electronic assembly and electronic technician areas respectively, the largest percentage growth, though the smallest number, will be in the broad area of drafting.

While the "bread and butter" areas show the greatest numerical growth, significant growth is also shown in the high technology areas of robotics, computer assisted design (CAD), computer assisted manufacturing (CAM), and fiber optics. The exact number of new jobs is difficult to assess based upon the relatively small number of industrial respondents. While the percentage increases in these fields will range from 100 to 700 percent over the present employment force, the absolute number of new positions is not known with great assurance. The report indicates that the high technology area should be looked upon as having a significant impact through the job multiplier effect in service and other areas through improved productivity. The rank order of geographic growth areas nationally is as follows: (1) West, (2) Southeast, (3) Northwest, (4) New England, (5) Southwest, (6) Midwest, (7) Mid Atlantic.

The results also point out that companies with 50 or fewer employees predict the larger percentage increase in additional future technician jobs as compared with companies employing 500 to 1,000 persons. Additional growth is also anticipated nationally in the professional areas of baccalaureate degree and higher engineers in the area of software engineering, computer analysts, and electronics engineering. The AEA report further goes on to state that approximately 16 percent of the technician increases are based upon anticipated defense contracts from the United States Government.

These results, while very significant, do not give the full picture. The military services will also need increased numbers of personnel to operate and maintain the increasingly complex weapons and related systems that are continually coming on line.

In the area of robotics a recent study by the W. E. Upjohn Institute for Employment Research predicted that some 32,000 to 64,000 new jobs will be created in robot manufacturing, supply, engineering and use by 1990. But well over half of the jobs created will require two or more years of college training.

The largest single occupational group of jobs created by robotics will be robotics technicians, those with the training or experience to test, program, install, trouble-shoot, or maintain industrial robots. Some 12,000 to 25,000 technicians will be needed by 1990, most of whom will be trained at community and technical colleges, according to the report.

Technician Supply Survey

A study completed by the National Council for Occupational Education in 1984 surveyed 353 industries in 20 metropolitan areas to attempt to assess technician training needs. A copy of this monograph is attached for the review of the committee.

The average number of employees per firm surveyed was about 1,400, while the average number of professional engineers was 117 or about 8 percent of the companies' total workforce. The average number of technicians per firm was 116, or also about 8 percent of the workforce. While over 60 percent of the responding firms indicated that the survey question on "number of technicians to support one engineer" was not applicable, national statistics developed by Vetter and the Scientific Manpower Commission indicate the national average on the number of technicians to support one engineer is on the order of three to five technicians to one engineer.

In the area of minimum educational requirements for entry level technicians, community and technical colleges received their greatest support. Thirty-seven percent of the industries surveyed indicated that the associate degree was the minimum educational requirement for entry level technicians in their firm. While 26 percent of the industries gave more than one category, the 37 percent response for the associate degree is contrasted with 11 percent and 10 percent respectively for the bachelor's degree and the high school diploma. The recognition of the associate degree by business and industry gives much support for AACJC/ACCT legislative initiatives in Congress to utilize community and technical colleges in "putting America back to work" and in helping to meet the technician needs of the military.

Minimum Educational Requirements for Entry-Level Technicians

Level	% Responding
Associate Degree	37.0
Bachelor's Degree	11.0
High School Diploma	9.9
Other	7.0
Industry In-house Training	4.7
Equivalent Military Training	4.2
More than one level given	26.2

Why Community and Technical Colleges?

Community and technical colleges are perfectly positioned with their training capabilities in both the associate degree areas as well as customized short-cycle training for adults and other dislocated workers. The emphasis in H.R. 2353 on outcome competencies is also excellent. This is the direction which technical and community colleges are taking. Community and technical colleges are also positioned well to meet the matching non-federal funding requirement through their institutional foundation activities of resource development along with the support which they regularly receive through advisory committees composed of business and industry representatives.

Another project of NCOE that impacts on the goals of H.R. 2353 is our recent monograph entitled "Criteria for Excellence in Associate in Applied Science Degree Programs." This monograph outlines an A.A.S. degree program with a strong emphasis in math, science and technical skills. This monograph has been approved on first reading by the Board of Directors of the American Association of Community and Junior Colleges as a proposed national policy statement.

In "Putting America Back to Work" the AACJC Task Force members identified a number of areas where community and technical colleges were well positioned to fill these skills needs. They indicated that the nation's over 1,200 community, technical and junior colleges can (1) prepare technicians and skilled workers for specific occupations, including defense-related occupations, and (2) provide literacy training, upward mobility, and retraining opportunities for employees particularly aimed at skilled worker shortages, and (3) participate in statewide economic development and reindustrialization strategies.

The AACJC/ACCT legislative program for 1984-85 indicates the capabilities of community and technical colleges to meet the needs of business and industry for trained technicians. In addition, community and technical colleges can augment specific technician needs identified by the military services.

A further project of AACJC/ACCT supported by the Sears-Roebuck Foundation is also applicable to H.R. 2353.

The "Keeping America Working (KAW) project is aimed at developing a stronger partnership between community and technical colleges and business, government and other levels of education. This is vital as we seek to truly meet the advanced technician training needs of business to assist in modernizing and increasing productivity. A recent report of the Keeping America Working project based on a survey of 72 technical and community colleges showed some of the following positive results:

Business/Industry/College Collaboration

The number of firms involved with industry/college partnership training programs varied from a low of 33 for rural institutions to a high of 455 for urban institutions.

Over 25,000 employees took job-related courses in one year. An overwhelming majority (21,000) of these employees were trained by the urban institutions.

Course/Instructional Profile

Over 800 different courses/programs were offered by the colleges to the employees of their area industries. Of these, two-thirds were offered by urban institutions.

Eighty-five percent of all the institutions reported offering the courses/programs either at the plant or on the college campus.

Technical and Vocational Programs

More than half of all urban institutions reported offering over 41 degree programs, while one-fifth of suburban and rural institutions reported offering this number.

Fifty-four percent of all responding institutions reported offering between 1 and 20 certificates.

Ninety-four percent of the institutions reported that they had established industrial advisory committees for their degree programs.

Almost all institutions reported participation in the work-related programs for which the students were awarded credits. The participation rates varied from 28 percent in National Guide for Training Program to 90 percent participation in Cooperative Education.

Eight out of ten institutions reported offering between 1 and 20 credits for work-related experience.

High School-Community College 2 + 2 Connection

A major initiative supportive of H.R. 2353 is a current 2 + 2 thrust of AACJC and its National Council on Occupational Education. This program is designed to outline a planned program of study that a student would follow starting with grades 11 and 12 in high school and culminating with earning an Associate in Applied Science degree in Electronics Engineering Technology or Computer-Aided Design/Drafting for example. AACJC President Dale Parnell has suggested that this program be called "the 2 + 2 Tech-Prep/Associate Degree Program." An approach developed in 1983 that will be very supportive of the 2 + 2 approach is the Principles of Technology project developed by the Center for Occupational Research and Development (CORD) and the Agency for Instructional Television (AIT). This is discussed briefly by Larry Selland in the March, 1984 Voc Ed Journal.

> "The Principles of Technology project will help balance education's response to the need for increased technological awareness and understanding. Neither the single-track high school plan nor the traditional vocational education approach will adequately serve all students. Placing all students in a single, rigorous academic track fails to take into account the different abilities, aptitudes and interests of individuals.
>
> The material in the Principles of Technology program seeks a middle ground. It calls for the blending of academic and vocational education to meet the increased math and science requirements. It maintains a rigorous math and science program for the college bound, while providing math and science in an applied setting for vocational students. The material is packaged in modules, making it adaptable to almost any instructional setting.
>
> The system uses video presentations and hands-on laboratory exercises to make learning effective and appealing for the vocational student. In a concrete and practical manner, it shows how technical concepts and principles apply to the mechanical, thermal, electrical and fluidal (hydraulic and pneumatic) systems that are the foundation of high technology. The instructional materials, organized into 13 concept modules, consist of student and teacher manuals, 156 laboratory exercises and demonstrations, and 500 minutes of video.

The modules can be used as part of a one or two year technical program for high school vocational students, or they can be integrated into existing courses. The content of the material is based on the Unified Technical Concepts Program, developed by CORD for use at the post-secondary level."

Human Resource Development

H.R. 2353 is also supportive of developing our Human Resources where we currently lack an overall national policy. NCOE recognizes that we need to focus on several areas:

- Increase the level of productivity to keep profitable and meet foreign competition
- Retool America, both equipment and people
- Address the needs of dislocated workers for basic skills, restoration of self-confidence and improved technical skills
- Address the needs of high school dropouts that lack basic skills

Summary

It is the hope of the members of the AACJ National Council for Occupational Education that the review presented here will indicate that H.R. 2353 is fully supported by NCOE and that America's community and technical colleges stand at the ready to support the Purpose as outlined in H.R. 2353.

Thank you very much for your invitation to speak to you briefly today on this vital topic for America.

Dr. H. James Owen
President
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(Kingsport and Bristol) 615-323-3191 - 615-282-0800 (Johnson City)

Graduated from high school in Westchester County, New York; received his B.A. and M.A. from the State University of New York at Albany, New York; received his Ph.D. in Political Science and Higher Education from the University of Georgia in Athens, Georgia.

Experience Background:

- Instructor, Political Science, St. Petersburg Junior College, St. Petersburg, Florida, 1960-66.
- Chairman, Division of Social Science & Assistant Professor of Political Science, Albany Junior College, Albany, Georgia, 1966-68.
- Assistant Executive Secretary, Commission on Colleges, Southern Association of Colleges and Schools in Atlanta, Georgia, 1971-73.
- Vice President for Campus Operations at Florida Junior College at Jacksonville, Jacksonville, Florida, a multi-campus comprehensive community college, serving over 18,000 FTE students, 1973-78.
- President, Guilford Technical Institute, Jamestown, North Carolina, Serving the cities of Greensboro and High Point, 1978-80.
- Vice President for Program Services, North Carolina Department of Community Colleges, Raleigh, North Carolina, 1980-83.
- President, Tri-Cities State Technical Institute, Blountville, Tennessee. Serving the Tri-Cities of Bristol, Kingsport, Johnson City, 1983 - present.

Additional Information:

- Married, wife, Leah; one child, Jeffrey
- Member of Munsey Memorial United Methodist Church
- Member, Rotary Club of Johnson City
- Former Member, North Carolina Employment and Training Council
- Former Member, North Carolina Balance of State Private Industry Council
- Former Member, North Carolina Fire Commission
- Former Member, North Carolina Criminal Justice Education and Training Standards Commission
- Former Member, North Carolina Apprenticeship Council
- Member, Bristol-Kingsport-Sullivan County Industrial Commission
- Member, Johnson City-Jonesborough-Washington County Economic Development Board
- Member, Kingsport Chamber of Commerce, Economic Development Council
- Member, Elizabethton/Carter County Economic Development Commission
- Member, Bristol Chamber of Commerce, Economic Development Council

Selected Professional Memberships:

- President and Member, Board of Directors, American Association of Community and Junior Colleges, AACJC, National Council for Occupational Education, 1985-86
- Secretary and Member, Board of Directors, AACJC, National Council on Community Services and Continuing Education, 1985-86
- Member, Policy Committee, American Vocational Association (AVA), Technical Education Division, 1985-86
- Member, Omicron Tau Theta, National Honorary Fraternity in Vocational-Technical Education, University of Tennessee, at Knoxville Chapter
- Former Member, Board of Directors, North Carolina Community College Adult Education Association
- Former Member, Steering Committee, North Carolina Association of Community College Instructional Administrators
- Former Member, Policy Committee, North Carolina Vocational Association
- Former Member, North Carolina Association of Colleges and Universities, Committee on the College Student

Mr. **Walgren**. Thank you very much, Dr. Owen, I appreciate that. Dr. Anderson.

Mr. **Anderson**. Chairman Walgren, members of the Subcommittee on Science, Research and Technology:

My name is Dr. Richard T. Anderson. I am the district director of the Waukesha County Area Vocational, Technical and Adult Education District.

The Wisconsin technical and adult education system consists of 16 technical college and technical institute districts that offer a variety of occupational programs including the 2-year associate degree.

The Wisconsin technical colleges and technical institutes have historically worked very closely with business and industry in order to ensure that the institutions provided technical programs that were most appropriate for the occupational needs of the citizens of the State in our local districts.

We operate more like entrepreneurial businesses than the traditional governmental collegial bureaucracy. While the local districts have provided specific courses and programs for employees of companies or employer groups for many years, it was not until 1980 that districts began to emphasize the development of training programs in conjunction with specific employers which were not open to the general population.

The benefits of such arrangements to our regular programming and student body are many and varied. The development of advanced technology-based curriculum, teacher training, equipment acquisition, job placement and similar activities have been extremely helpful as they were carried over into our regular programs.

A national policy that endorses and promotes an expansion of these types of activities on the part of local school districts will be very helpful in gathering local support for these necessary partnerships.

While these kinds of joint school/employer planning and implementation relationships and activities are occurring in all of the schools in Wisconsin, I will highlight some of the joint planning and programming that is taking place at the Waukesha County Technical Institute because I am most familiar with my own district.

WCTI, for your information, is located immediately west of Milwaukee County. Our population base is approximately 300,000 persons.

My written testimony has a description of our district and our service area but I would like to highlight just a few points.

WCTI currently serves about 35,000 students. The majority of the student body attend part time. The full-time collegial equivalency is about 6,200 students. Of that enrollment, about 10,000 students are enrolled in 45 occupational programs, including accounting, electronics, nursing, welding, and so on. About 19,000 students are enrolled in courses designed to upgrade their occupational skills, including new tax laws, robotics repair, entrepreneurial training, and similar types of courses.

About 3,000 students are enrolled in courses designed to upgrade their academic skills in reading, writing, and calculating. And about 3,000 students are enrolled in courses designed to upgrade their personal skills and understandings, including foreign languages and craft courses.

The impact of the institution on the community is many, but there are two points I would like to stress. The salaries earned last year by WCTI graduates from just the last 5 years of graduating classes were in excess of $35 million. Those graduates paid over $6 million in taxes last year.

In 1980, the WCTI board approved a plan to begin offering courses to specific employers for their employees on a contract basis. The reception to this plan and the growth of this plan has been very impressive. In 1981-82, we had contracts with 20 companies, offering 32 courses, serving 903 employee/students. In 1982, that number went to 38 companies, 48 courses, and 1,386 employee/students. 1983-84, it went to 47 companies, 79 contracts, and 2,094 students. 1984-85, last year, we doubled to 102 companies, 148 courses, and 5,396 student/employees. Our goals for the 1985-86 year are 125 companies, 175 courses, and 7,000 employee/students.

Examples of the types of courses are: word processing, quality assurance, ultrasonic testing, computer numerical control, laser instruments, supervisory training, robotics maintenance, and Lotus 1-2-3.

In 1983, the WCTI board approved a plan to allow WCTI to provide entire programs for specific employers or employer groups.

WCTI is the General Motors Training School for Wisconsin for the electronics/computer-based 2-year associate degree program for automotive service technicians. The students do not attend classes in the regular sequence. They come and go in unique time blocks over the duration of the program. On-the-job experiences at General Motors dealerships occurs during specific time blocks within the programs.

WCTI is currently piloting an experimental electronics telecommunications 2-year associate degree program for a large utility in which the students will be attending WCTI all day on Friday, Saturday, and Sunday, every other weekend for 3 years.

A group of area employers jointly planned an electronic chip design associate degree program for WCTI. This employer planning group flew WCTI staff around the country to research curriculum, and they provided seed money to implement the program.

Wisconsin technical colleges and institutes are making great use of JTPA funds to assist in training the unemployed and displaced workers, but these funds are targeted to serve specific populations. It is extremely difficult to use JTPA funds to train persons for high technology occupations.

As Jim has said earlier in his testimony, JTPA stresses short term, get-back-to-work-quickly type of programs. It is very difficult to get local councils to utilize JTPA moneys for long-term associate degree type training.

Wisconsin technical colleges and institutions welcome the opportunities a bill such as H.R. 53—H.R. 2353—would provide us to expand our abilities to assist our business and industry to become more efficient, effective, and profitable through a better trained work force.

Operationally, this bill will attitudinize and legitimize the growing interrelationship between this country's community colleges, technical colleges and technical institutes, and the business and industrial community.

It was of great interest to listen to the representative from the National Science Foundation speak earlier. One of the points that we would like to stress as to why I think it's appropriate to have some kind of tie with the National Science Foundation is the whole issue of technology transfer. Some of the previous questions that were addressed to Dr. Moore gave the illusion, which I think is a correct one, or perception, that the National Science Foundation has little interest in the whole concept of technology transfer.

We are finding that all of the great and wonderful ideas that are being presented research and developed at our graduate institutions are of minimal value to that smaller manufacturer if there is no way for them to understand what it is and how you get it into the production facility.

The technical colleges, technical institutes in Wisconsin have a new legislative authority in technical assistance—making it now it's legitimate for us to assist in technology transfer. But we need that facilitation between our types of schools and senior colleges in order to be able to pull this thing off. We are working very carefully with the University of Wisconsin in Wisconsin, but the prestige of having the National Science Foundation have an integral relationship to this whole process, I think, would provide immeasurable assistance in developing legitimization—if there is such a word—of this relationship between 2-year schools and our senior research institutions.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Anderson follows:]

HR 2553, THE NATIONAL ADVANCED TECHNICAL TRAINING ACT

(Testimony)

Delivered to Subcommittee on Science, Research and Technology

Representative Doug Walgren, Chairman

By
Dr. Richard T. Anderson
District Director
Waukesha County Technical Institute
Pewaukee, Wisconsin

November 19, 1985

Chairman Walgren, members of the subcommittee on Science, Research and Technology.

The Wisconsin Vocational, Technical and Adult Education system consists of 16 technical college and technical institute districts that offer a variety of occupational programming including two-year associate degrees.

The Wisconsin technical colleges and technical institutes have historically worked very closely with business and industry in order to ensure that the institutions provided training programs that were most appropriate for the occupational needs of the citizens of the state and our local districts.

While the local districts have provided specific courses and programs for the employees of companies or employer groups for many years, it was not until 1980 that the districts began to emphasize the development of training programs in conjunction with specific employers which were not open to general public enrollments.

The benefits of such arrangements to our regular programming and student body are many and varied. The development of advanced technology based curriculum, teacher training, equipment acquisition, job placement and similar activities have been extremely helpful as they were carried over into our regular programs.

A national policy that endorses and promotes an expansion of these types of activities on the part of the local schools will be very helpful in gathering local support for these necessary partnerships.

While these kinds of joint school/employer planning and implementation relationships and activities are occurring at all the schools in Wisconsin, I will highlight some of joint planning and programming that is taking place at the Waukesha County Technical Institute because I am most familiar with my own district.

WCTI is located immediately west of Milwaukee County. Our population base is approximately 300,000 persons.

WCTI FACTS AT A GLANCE

The Waukesha County Technical Institute (WCTI) is a two-year, post-secondary school district with campuses in Pewaukee, Waukesha and Menomonee Falls. The mission of WCTI by state statute is:

> To initiate, develop, maintain and supervise programs with specific occupational orientations below the baccalaureate level and adult education below the professional level.

Translated into program objectives, WCTI is responsible:

1. To offer occupational programs to prepare a person for employment.
2. To offer programs to upgrade a person's occupational skills.
3. To offer programs to upgrade a person's academic and personal skills.
4. To provide technical assistance to business and industry.

WCTI was established in 1923 as an offshoot of the Waukesha public schools. In 1967, WCTI became a district that currently includes most of Waukesha County and parts of Racine, Jefferson and Dodge Counties.

ENROLLMENT AND PROGRAMMING

WCTI currently serves about 35,000 students. The majority of the student body attend part-time. The full-time collegial equivalency is about 6,200 students.

About 10,000 students are enrolled in 45 occupational programs including accounting, electronics, nursing and welding.

About 19,000 students are enrolled in courses designed to upgrade their occupational skills including new tax laws, robotics repair, and entrepreneurial training.

About 3,000 students are enrolled in courses designed to upgrade their academic skills in reading, writing, and calculating.

About 3,000 students are enrolled in courses designed to upgrade their personal skills and understanding including foreign languages and craft courses.

IMPACT

Approximately ninety-five percent (95%) of WCTI students are residents of the district.

Seventy-seven percent (77%) of WCTI live or work in the district after graduation.

Ninety percent (90%) of WCTI graduates are employed.

Seventy-three percent (73%) of WCTI graduates are placed in jobs related to their occupational training.

The salaries earned last year by WCTI graduates from just the last five years of graduating classes were in excess of $35 million.

Those graduates paid over $6 million in taxes last year.

In 1980, the WCTI Board approved a plan to begin offering courses to specific employers for their employees on a contract basis. The reception to this plan and the growth of that has been impressive.

Year	Number of Companies	Number of Courses	Number of Employees/Students
1981-82	20	32	903
1982-83	38	48	1386
1983-84	47	79	2094
1984-85	102	148	5396
1985-86 (goals)	125	175	7000

Examples of the types of courses are: Word Processing, Quality Assurance, Ultrasonic Testing, Computer Numerical Control, Laser Instruments, Supervisory Training, Robotics Maintenance, and Lotus 1-2-3.

In 1983, the WCTI Board approved a plan to allow WCTI to provide entire programs for specific employers or employer groups.

WCTI is the General Motors Training School for Wisconsin for the Electronics/Computer-Based Two-Year Associate Degree Program for Automotive Service Technicians. The students do not attend classes in the regular sequence. They come and go in unique time blocks over the duration of the program. On-the-job experiences at General Motors dealerships occur during specific time blocks within the programs.

WCTI is currently piloting an experimental Electronics Telecommunications Two-Year Associate Degree Program for a large utility in which the students will be attending WCTI all day on Friday, Saturday, and Sunday, every other weekend for three years.

A group of area employers jointly planned an Electronic Chip Design Associate Degree Program with WCTI. This employer planning group flew WCTI staff around the country to research curriculum and they provided seed money to implement the program.

Wisconsin technical colleges and institutes are making great use of J.T.P.A. funds to assist in training the unemployed and displaced workers, but those funds are targeted to serve specific populations. It is extremely difficult to use J.T.P.A. funds to train persons for high-tech occupations.

Wisconsin technical colleges and institutions welcome the opportunities a bill such as H.R. 2553 would provide us to expand our abilities to assist our business and industry to become more efficient, effective and profitable through a better trained work force.

Operationally, this bill will attitudinize and legitimize the growing inter-relationships between this country's community colleges, technical colleges and technical institutes.

ANNUAL REPORT

Economic Development Activities
July 1, 1984 -- June 30, 1985

VTAE District: Waukesha County Technical Institute

Economic Development Coordinator: Barbara S. Keller

Date: August 21, 1985

1) BUSINESS AND/OR INDUSTRIAL DEVELOPMENT:

Forward Wisconsin:

WCTI staff have been active participants in Forward Wisconsin call trips and call trip training.

Local Economic Development:

During this year, WCTI staff have been actively working with Economic Development groups in six District communities to improve their "product" (the community). This has involved planning workshops; organization of volunteer task forces; improvement of industrial parks, streets, sewers, downtowns, housing, parks, arts, etc.; development of marketing materials; and linking communities to state business developers such as Forward Wisconsin, Wisconsin Electric Power Company, Department of Development, and the Milwaukee Chamber. These efforts are just beginning to result in the actual attraction of new business to Waukesha County.

Small Business:

WCTI has initiated active exploration of ways to increase local services and support for entrepreneurs in the areas, Carroll College, the Small Business Administration, University of Wisconsin Extension and a variety of political and business leaders in the District are involved. Resource centers or incubators are being discussed.

2. RETENTION/TECHNICAL ASSISTANCE:

Welding:

Welding certification was provided to the following companies: Hi-Ranger, Tel-Smith, Lather's Union, Construction Supply and Erecting, and Kuester Welding. Specialized certification was also offered to Envirex for piping certification; Dalum's for company structural certification; Caterpillar Tractor for State structural certification; and Waukesha Engine/Dresser Industries for company brazing certification.

Wisconsin Drill Head:

Offered a unique "slot-in" situation for day classes and a three semester approach for evening classes for Wisconsin Drill Head metalworking employees.

Waukesha Engine/Dresser Industries:

Offered employees a unique "slot-in" opportunity in the Industrial Maintenance program.

RES Manufacturing:

Special placement efforts were designed for entry level employees to RES.

Cooney Press:

Provided four hours of assistance in computer typesetting on their new Comp Edit 7700 machine.

Applied Power:

WCTI assisted in the filming of, editing of, adding script to and producing of Blackhawk equipment training aids.

Milwaukee Sentinel:

Tested recipes for the Food Fair Cookbook.

Nasco, Inc.:

Tested recipes for cookbook featuring competitive recipes of American home economics teachers.

Borgasian's:

Provided slot-in opportunity for employees for learning drapery and window treatment. Also worked with company to provide technical assistance on drapery workroom, set-up, record keeping, etc.

WCTI ECONOMIC DEVELOPMENT ANNUAL REPORT UPDATE
July 1, 1984 - June 30, 1985

Area #3: Quick Start Customized Training Activities

Magna Tech

73 enrollees

Magan Tech Corporation recently moved into Waukesha County. The company is expanding rapidly. They have added 200 employees since moving into our area and project 100 more in the near future. Beginning with a Quality Assurance course, WCTI has developed an ongoing training relationship to this company. Two other courses, Industrial Measurement and Blueprint Reading were run in 1984-85. A contract has already been signed for several more courses in 1985-86.

Waukesha Engine

90 enrollees

WCTI has an ongoing training relationship with Waukesha Engine, a division of Dresser Industries a major multinational firm. Of particular note in the last year, Waukesha Engine secured a contract to produce a new turbine for an overseas firm. They needed their shop people geared up to produce this high tech product with quite different tolerances from previous products produced at the Waukesha plant. WCTI responded using an apprenticeship circuit instructor. A second course was also run for plant engineers when they discovered their shop people were suddenly ahead of them in training.

General Electric

152 enrollees

A special relationship exists between WCTI and General Electric Medical Systems, our Pewaukee Campus next door neighbor. GE management through their Development Office selects about eight WCTI courses each year to offer, on a "closed course" contract basis, to their employees. Courses range in content from LOTUS 1-2-3, to Electronics, to Medical Imaging Physics. These courses are regularly run on campus at the end of the GE employees workday.

Quad/Graphics

112 enrollees

Quad/Graphics is an unusual company which has recieved a great deal of publicity for its new organizational style and participatory management emphais. Quad management and WCTI staff jointly identified the critical training areas needed to enhance this company's style and philosophy. In the past year these courses have included: Leadership Training, Human Relations, and Study Skills. Quad believes these courses contain the specific skill training needed to equip their employees for the future of the company.

Project COPE Outplacement Services:

Outplacement services were provided through Project COPE to Johnson Controls, ElmBrook Hospitals, St. Mary's Hospital, General Electrict, RTE, Harnischfeger, Waukesha Engine, Waukesha Bearings, and the Communications Workers of America who have been forced to make major staff cutbacks during this year.

Retention Studies/Calls:

WCTI staff is actively involved in local retention studies and calls on business. During this past year four to six staff have worked with each of the following communities: Menomonee Falls, Butler, Oconomowoc. The WCTI Economic Development Officer also works with the Metro-Milwaukee Chamber (four county) Retention Committee making calls, identifying single business and industry-wide problems, and helping to create solutions.

Chamber Team:

Eight WCTI staff have been assigned to work with eight of the larger area Chambers/Business Associations. They create annual objectives for their work with these chambers; this is an intentional effort to strengthen these groups, to assist them in strengthening local business, and to offer WCTI seminars/courses jointly to small businesses through these groups.

W. A. Krueger:

At the request of Forward Wisconsin, WCTI has been actively involved in analyzing training needs and promotion practices at W. A. Krueger in order to assist in retraining and expanding this major Waukesha employer.

Retention Courses:

One hundred and forty-eight courses were run for 102 existing local employers to upgrade 5396 employees toward stabilization, growth and retention of these firms.

3. QUICK-START TRAINING:

EMPLOYER	COURSE	NUMBER
Kettle Moraine Park Rangers	Baton Training	
Waukesha County Reserve Officers	In-Service Training	
Fortress Manufacturing Company	Basic Machining Practices	
American Industrial Hygiene Association (c)	Asbestos Safety Seminar	50
General Electric (5 secs.) (c)	Introduction to PC DOS	80
General Electric (8 secs.) (c)	LOTUS 1-2-3	64
General Electric (c)	LOTUS 1-2-3 (Specialized)	8
RTE (c)	Word Processing	8
WTMJ (c)	LOTUS 1-2-3	8
Waukesha Memorial Hospital (c) (4 secs.)	Word Processing	24
Waukesha Memorial Hospital (3 secs.) (c)	CRT/Keyboarding	24
Product Miniatures (c)	Supervisory Training	16
Wisconsin Lift Truck (c)	Supervisory Training	17
Quad/Graphics (2 secs.) (c)	Leadership Training	25
Quad/Graphics (2 secs.) (c)	Human Relations	57
Quad/Graphics (3 secs.) (c)	Study Skills	30
Bureau of Mine Safety (c)	Annual Seminar	40
Plumbers (c)	New Code Review	240
Western Envelope (c)	Supervisory Training	15
Process Display (2 secs.) (c)	Human Relations	34

Waukesha Bearings (c)	IBM PC Training	6
Artos Engineering Company (2 secs.) (c)	Geometric Tolerancing	31
Greater Milwaukee Auto Truck (c) Dealers Association	Unibody Repair	
Husco/AMCA International (3 secs.) (c)	Geometric Tolerancing	58
Industrial Truck Dealerships (c)	Servicing of the Electrical Components for Lift Trucks	60
Magna Tech (c)	Blueprint Reading	24
Magna Tech (c)	Industrial Measurement	24
Magna Tech (c)	Quality Assurance	25
Western Envelope (c)	How Attitudes Make	16
Hi-Ranger (c)	Process Control	10
Waukesha Engine (5 courses) (c)	CNC Editing	90
Fortress Forms, Inc. (c)	Process Control	10
Wisconsin Centrifugal (c)	Word Processing	12
Review Services Walworth County Sewage District (c)	LOTUS 1-2-3	8
Western Envelope (c)	Office Personnel/ Professional Development	15
Brookfield Square Merchants (c)	Retail Sales Techniques	19
U. S. Controls (c)	Methods Time Measurement	13
Northview Nursing Home (c)	Introduction to Basic Food Prep	10
Pewaukee Women's Club (c)	Food Service Training	12

4. PLANNING:

Business and Industry Marketing Materials:

During this year extensive planning and coordinator has gone into the development of a tabloid specifically designed for business and industry. The tabloid provides a menu of courses and services particularly appropriate to meeting business and industry needs.

An improved presentation folder describing WCTI services to business is another product of this past year.

Business Information Service:

WCTI designed and was selected by the Waukesha County Board to implement a Waukesha County Business Information "Hotline". The 800 number provides access to business assistance resources for established businesses, entrepreneurs, and businesses considering moves into Waukesha County.

"Pipeline for Excellent Products"

WCTI initiated a project modeled after the "Buy Michigan" effort which will link local vendors of components, parts and products to local buyers. The project will initially encompass the six Southeastern Wisconsin counties. Wisconsin Gas Company has recently agreed to fund and staff the effort; several other organizations are also involved. Within one year we hope to expand to a statewide computerized system.

Re-organization:

WCTI is in the process of a major internal structural reorganization to become more responsive to business needs. The reorganization establishes a business needs analysis/marketing division. This division will market the courses and services offered through other units of the organization to better meet the training, upgrading, and technical assistance needs of existing local business. The economic development office efforts in the areas of development and attraction of new business and strengthening of local community development efforts will continue in concert with this new effort.

BSK:kab/15/f

PARTNERSHIPS AT WORK

THE WAUKESHA INTERNATIONAL HARVESTER STORY

In 1983 when the national economy took a nose-dive, so did the fortunes of International Harvester's (IH) foundry in Waukesha, Wisconsin. Faced with massive lay-offs, pay cutbacks, and loss of business, the foundry was about to be shut down. New facilities were needed to house equipment brought up from the IH Memphis plant. Costly new state-of-the-art equipment was needed. Ralph Anderson, IH plant manager, began a search for community assistance. The Chamber Board, led by then President, Bob Heckel, responded to help the company find funds. Thanks to Bob, a three million dollar pot was developed through bonds purchased by several Waukesha financial institutions and the Wisconsin Electric Power Company. Heckel saw an opportunity for the Community to work together. "No one thought Harvester could do it by themselves. By working with area financial institutions and WCTI, we not only found the money, we found the training. Together, we did it!"

While the Chamber of Commerce took on the job of finding resources, Waukesha County Technical Institute volunteered to commit staff and time to providing training. The first step was to locate funds. WCTI helped IH win two grants. Through the Wisconsin Department of Development, the company received Customized Labor Training Fund monies which were used in upgrading the skills of certain current workers. The second grant, from the Job Training Partnership Act (JTPA) Title III funds, was to be used for training new employees. These people were later hired by IH. Wisconsin Governor Anthony Earl endorsed the grants and personally came to Waukesha to show his support.

Once funding was located, curriculum planning and training could become a reality. Ron Butt, WCTI Trade and Apprenticeship Program Coordinator, worked with IH to identify non-destructive ultrasonic testing techniques, their first priority. Harvester made it very clear that they wanted training that was just as practical as it was relevant. Butt found an instructor, Jack Schmidt, who was sent for specific training on ultrasonic equipment from the Sperry Company, makers of the equipment IH planned to use.

Schmidt then developed the needed curriculum. Because the machinery was computerized, WCTI Data Processing Specialist, Tom Mills, assisted by writing a training manual for the Numerical Control equipment training. They worked throughout the winter and into the spring.

Classes for current workers were scheduled to run in shifts so that the company would not have to pull everyone off the job at once. By June 1, 1984, the foundry had twenty-eight trained new employees. These new employees were hired with JTPA on-the-job training funds which eventually provided the company with over $50,000 in financial assistance.

Training of production and maintenance employees followed. To make the theory portions of the class more applicable, copies of original machinery blueprints were made. When theory was presented it was applied to the specific equipment employees were working on. In addition, when IH had problems with the new equipment, as it was assembled, WCTI instructors acted as troubleshooters to get it into operation.

The foundry is now back on its feet with over 300 employees. "We got our money's worth," Harvester's human resources manager, Norm Ruehl declared. "The training was very, very worthwhile. We have worked with WCTI for years. Just about everyone here is gone there for one thing or another. When an area technical institute is run like WCTI, I'd recommend them to any company."

The benefits are not all one-sided. According to Ron Butt, "The institution benefits as does the company. Our faculty receives direct contact with industry and they learn the technology companies are using today." We teach, they produce. We both learn.

"TOGETHER, WE DID IT!"

THE BUSINESS CONNECTION

A PUBLICATION OF WAUKESHA COUNTY TECHNICAL INSTITUTE

CLASS SCHEDULE ■ FALL 1985

RESUME

WAUKESHA COUNTY TECHNICAL INSTITUTE

OBJECTIVE

Meet the needs of individuals, businesses, and industries by providing the resources and training necessary to achieve occupational success through quality educational services.

CREDENTIALS

- ANTICIPATING the needs of business, WCTI provides training in 45 Associate Degree and Vocational programs.
- PROVIDES over 2,300 Continuing Education courses yearly designed to train, upgrade and refine skills.
- ADDRESSES the needs of business and industry by providing state of the art instruction and technical assistance based on input from more than 240 employers and employees serving on the 72 educational program advisory committees.

EXPERIENCE

- Training of more than 2000 employees in the past year.
- Delivering more than 79 customized courses annually to more than 48 specific industries.
- Hiring over 300 part time professionals from business and industry to provide up to date, quality instruction.

REFERENCES

The following is a partial list of private companies, government agencies, and others who were directly served by educational programs at WCTI

Generac
Waukesha County
Quadgraphics
New Berlin Hospital
Northwest Telephone
City of Brookfield
City of Waukesha
GE Medical Systems
Oconomowoc Utility
New Berlin City
Process Displays
Waukesha Engine
Westmoreland Manor
Carpenter's Union
Hein Werner
Fortress Forms
Ortho Kinetics
Stolper Industries
Hamilton School District
Waukesha County Dept. of Aging
Peerless Gear & Engineering
Wisconsin Centrifugal
Elmbrook Hospital
General Castings Corp
Waukesha Public Schools
Western States Envelope
Independence Bank of Waukesha
ASEA Industrial Systems
Carnation Can Company
Wisconsin Bell
Woodland Health Center
Tudor Oaks Health Center
Refrigeration Service Engineer Society
Associated General Contractors of America
International Harvester
Village of Menomonee Falls
Wisconsin Treasurers Association

800 Main Street · Pewaukee, Wisconsin 53072 · (414) 691-5566

SERVICES

TECHNICAL ASSISTANCE

In accordance with its legislated mission, WCTI provides one on one assistance to resolve specific technical problems for local businesses. This is a relatively new service provided by Wisconsin's Vocational Technical Institutes.

Examples of services which could be provided include: customized employee screening/assessment services, trouble shooting assistance in the set up/start up of new equipment, programming for a newly acquired robot or other computerized equipment, equipment applications, standard operating procedures, welding certification services, media packages for on going employee training programs, suggested work procedure changes to increase productivity, out placement career planning services.

Please contact the WCTI Economic Development Office, 691 5257, for more information.

CUSTOM-DESIGNED TRAINING

Customized training is training developed specifically to meet the unique needs of an individual business or organization. Such courses can be made available to both large and small businesses.

Examples of the kinds of courses which have been delivered are: Quality Assurance, Computer Aided Design, Introduction to Lasers, Shop Inspection, Salesmanship, Supervisory Training, Human Relations Training, Small Business Seminars, Geometric Tolerance, LOTUS 1 2 3.

WCTI has several Program Coordinators available to work with individual firms to develop unique training packages, adapt existing curriculum to specific equipment or personnel needs, schedule training to meet company time frames, recruit and select quality training staff, evaluate worker competence, and provide recommendations for follow up training.

Please contact the WCTI Economic Development Office, at 691 5257, for more information.

TRAINING NEEDS ANALYSIS

Vocational training instructors regularly analyze job tasks and procedures and evaluate student performance on these tasks. WCTI offers this skill to local business; in the work place this translates into analyzing the present competence of workers and suggesting training packages to upgrade specific skills. You can also use this service to increase quality or productivity through recommendations for job redesign.

Please call the WCTI Economic Development Office, 691 5257, for more information.

BUSINESS INFORMATION SERVICE

The Waukesha County Business Information Service is a project of the Waukesha County Board utilizing the facilities and services at WCTI.

The Information Service provides a variety of information for established and developing businesses as well as those considering location in Waukesha County. The Service does not seek to duplicate existing resources, rather it provides a single place to call to find out about the many available resources and access them easily.

Information available includes: community contacts, courses and workshops, regional/state resources, funding/capital resources, community economic development volunteers, chambers and business organizations, technical assistance, statistical data, site information.

WAUKESHA COUNTY
SERVING BUSINESS
1 800 3 INFORM
(Local callers may use 691 5255)

STRATEGIC PLANNING WORKSHOPS

Strategic positioning and successful long range planning are key factors in business growth. New management studies stress the productive results of employee involvement in creating the goals they are expected to implement. The WCTI Economic Development Office is therefore offering its expertise to local business in designing and facilitating strategic planning workshops and processes.

Call Barbara Keller, Economic Development Officer, 691 5257, for more information.

LIBRARY

The WCTI Library welcomes the opportunity to serve local area businesses. The reference collection includes such directories as Dun and Bradstreet's Million Dollar Directory, Sheldon's Retail Directory, the United States Industrial Directory, the Classified Directory of Wisconsin Manufacturers, Best's Insurance Reports, and the Direct Marketing Market Place, as well as many up to date dictionaries, encyclopedias, and handbooks. Ready reference assistance is available via telephone by calling 691 5316. Our circulating collection includes holdings in word processing, computers, international trade, robotics, real estate, accounting, engineering, electronics, and manufacturing.

Our periodical collection includes the Wall Street Journal, Wisconsin Business Magazine, the Business Journal, Forbes, Inc., and many trade and professional journals. Data base searching, of such business databases a ABI/Inform, is available for a fee.

Anyone who lives in the WCTI district is eligible to use the library. Borrowing privileges are extended to area employees also.

ASSESSMENT SERVICES

Your business can decrease employee turnover by fifteen to twenty percent and, at the same time, reduce the expense of employee skill and career development. By incorporating standardized testing instruments into your personnel procedures, you can make informed decisions regarding prospective and current employees.

WCTI offers on site consultation by assessment and training personnel who will recommend a comprehensive assessment program best suited for your needs. Assessment of management styles, academic abilities, vocational skills, and customized screening are available through WCTI.

Evaluate WCTI's customized, proven, cost effective, and valid assessment procedures. Learn how you can implement these procedures in your company.

VOCATIONAL ASSESSMENT AND EVALUATION

- DESIGNED FOR:

  Individuals who want to gain significant career information about themselves. Vocational assessment helps identify aptitudes, abilities, interests and prior experiences that may influence further career and educational choices.

  Confronting a disability in the world of work may require professional assistance. Vocational Work Evaluation offered in cooperation with the Division of Vocational Rehabilitation may be the assistance you need. Discover your assets and methods of overcoming your disability through a comprehensive vocational work evaluation.

For more information, contact: Vocational Assessment at 691 5200 or Vocational Work Evaluation at 548 5866.

MANAGEMENT AND SUPERVISORY SKILL ASSESSMENT

- DESIGNED FOR:

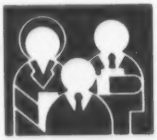
  Top management and personnel administrators to systematically determine which members of their management team need more skill development and which need more coaching.

- AREAS OF CONCERN:

  Skill performance is measured in the following areas: goal setting, work planning, work facilitation, feedback, control, and performance reinforcement. Levels of interpersonal relations can also be measured. In each of these areas raw scores are converted and measured against group norms. Organizational group norms can also be profiled. Other unique features of this WCTI exclusive service are:

  Multi level: data is gathered from self, superior, subordinates and/or peers
  Skill Oriented: not based on personality traits
  Multi Purpose: for individual and group assessments

For more information, contact Dr. Ned Timmel at 691 5252.



BASIC SKILLS ASSESSMENT

- DESIGNED FOR:

  High tech equipment and today's competitive markets demand employees with high proficiency skills in reading, computation and writing. Basic skill assessment is designed to identify the competitive levels in these skill areas. Development of these basic skills can follow the assessment.

- AREAS OF CONCERN:

  Trained assessment staff develop with you, the employer, the assessment package that meets the needs of you and your employees. After your needs are identified WCTI's on site consultant will develop an assessment plan which will include the assessment instrument, reporting procedures, and recommendation formats. Time and cost proposals will be presented with each assessment plan.

For information, call 691 5287.

CUSTOMIZED ASSESSMENT

- DESIGNED FOR:

  Effective employee screening or assessment procedures can be costly to the employer. Incorporating standardized assessment can be labor intensive. Through customized assessment WCTI can decrease your overall employee assessment expenses.

- AREAS OF CONCERN:

  Reading Assessment • Mathematical Assessment • Writing Assessment • Motor Skill Assessment • Visual Screening • Physical Capacities • Interest, Aptitude and Ability Assessment • Job Specific Assessment.

For more information, contact James Mullarkey at 691 5306.

COMPUTER CLASSES

CRT/COMPUTER KEYBOARDING

- DESIGNED FOR:

  The student who has no previous alpha or numeric skills on a keyboard. If your job requires keying the computer, this course will give you basic keying skills in a minimum amount of time.
- MAJOR TOPICS:
  - Alphabetic, numeric and symbolic control reach techniques on the computer.
  - Practice on an IBM CRT and microcomputer.
- SESSIONS/FEES/COURSE NUMBERS:

  Mondays, 12:30 3:20 p.m.
  7 sessions, $13.95
  September 9 October 21, 1985
  Course Number: 107 403 303

  Mondays, 12:30 3:20 p.m.
  7 sessions, $13.95
  October 28 December 9, 1985
  Course Number: 107 403 304

  Tuesdays & Thursdays, 2:30 4:20 p.m.
  10 sessions, $12.90
  September 24 October 24, 1985
  Course Number: 107 403 305

  Tuesdays & Thursdays, 2:30 4:20 p.m.
  10 sessions, $12.90
  October 29 December 3, 1985
  Course Number: 107 403 306

  Mondays & Wednesdays, 5:30 7:20 p.m.
  10 sessions, $12.90
  September 4 October 2, 1985
  Course Number: 107 403 307

  Tuesdays & Thursdays, 7:50 9:40 p.m.
  10 sessions, $12.90
  October 8 November 7, 1985
  Course Number: 107 403 308

  Tuesdays & Thursdays, 7:50 9:40 p.m.
  10 sessions, $12.90
  November 12 December 7, 1985
  Course Number: 107 403 309
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Business Occupations Bldg
  Room B 114

CRT DATA ENTRY SKILLS

- DESIGNED FOR:

  The student with no previous training who needs to enter information into a computer. The course emphasizes a "hands on" approach to learning and will give you experience on IBM CRTs, microcomputers and on line CRT equipment.
- MAJOR TOPICS:
  - Basic data entry skills
  - Skill building for speed and accuracy
  - Specific business applications
- SESSIONS: (28)

  Mondays, 9:30 a.m. 12:20 p.m.
  Wednesdays, 10:30 a.m. 12:20 p.m.
- FEE: $42.05
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Business Occupations Bldg.
  Room B 114
- COURSE NUMBER: 107 402 300

LOTUS 1-2-3 SPREADSHEET

- DESIGNED FOR:

  The business person who is a computer novice and needs to understand and use computer spreadsheets. You should have a working knowledge of data processing terminology or have completed the Business Microcomputer Concepts course (107 412). In this course you will use an IBM personal computer and the popular LOTUS software.
- MAJOR TOPICS:
  - Introduction to the IBM PC
  - Designing a spreadsheet
  - Entering and editing information
  - Using labels, values and formulas
  - Calculating values
  - Printing results
- SESSIONS: (8)

  Tuesdays & Thursdays, 7:50 9:50 p.m.
  September 10 October 3, 1985
- FEE: $10.70
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Business Occupations Bldg.
  Room B 114
- COURSE NUMBER: 107 417 002

BUSINESS MICROCOMPUTER CONCEPTS

- DESIGNED FOR:

  The first time computer user who wants to learn more about using a business computer system. Don't let those "bits and bytes" scare you — this course will help you understand and use them in your business.
- MAJOR TOPICS:
  - Basic microcomputer concepts
  - Fundamentals of data processing
  - The hardware, software and human elements of a business computer system
  - Limited "hands on" computer experience
- SESSIONS: 5

  Mondays, 7:00 9:50 p.m.
- FEE: $10.70
- LOCATION/COURSE NUMBER:

  WCTI Pewaukee Campus
  800 Main Street
  Business Occupations Bldg.
  Room B 201

  September 23 October 21, 1985
  Course Number: 107 412 003
  OR
  November 4 December 2, 1985
  Course Number: 107 412 004

  Also offered at center school campuses: Menomonee Falls, Mukwonago, Muskego, Hamilton Sussex, Kettle Moraine and Waukesha.

OTHER MICROCOMPUTER COURSES OFFERED:

107 410	Data Entry Applications
107 413	Business Programming in BASIC I
107 414	Business Programming in BASIC II
107 416	Microcomputer Spreadsheet Applications
107 418	Microcomputer Accounting Applications
107 419	Microcomputer Payroll Applications
107 417	Microcomputer Word Processing

TO REGISTER: CALL 691 2910
FOR MORE INFORMATION: CALL 691 5255

OFFICE SKILLS

SECRETARIAL TUNE UP

- DESIGNED FOR:

  Secretaries, office workers or others re-entering the workplace who want to polish their secretarial skills. Not every boss or company can afford to train you for new skills and responsibilities. Take charge of your future and improve your secretarial skills by investing a little of your own time. Textbook is required.

- MAJOR TOPICS:
  - Speedbuilding
  - Machine transcription
  - Typing letters, reports and tables
  - Editing and punctuation
  - Familiarity with other office machines
- FEE: $21.60
- SESSION/LOCATION/COURSE NUMBER:

Saturdays, 8:00 12:00 noon
WCTI Pewaukee Campus
Business Occupations Bldg., B-107B
September 28 November 23, 1985
Course Number: 106-401-302

Mon. & Wed., 2:30 4:20 p.m.
WCTI Pewaukee Campus
Business Occupations Bldg., B-107B
September 23 November 20, 1985
Course Number: 106-401-303

Tuesdays, 7:00 9:40 p.m.
Oconomowoc High School
641 Forest Street
September 24 December 10, 1985
Course Number: 106-401-304

Wednesdays, 6:30 9:10 p.m.
Menomonee Falls High School
W124 N8101 Merrimac Drive
September 25 December 11, 1985
Course Number: 106-401-305

Tuesdays, 7:00 9:40 p.m.
Muskego High School
W183 S8750 Racine Avenue
September 24 December 10, 1985
Course Number: 106-401-306

Wednesdays, 7:00 9:40 p.m.
Brookfield Central High School
16990 Gebhardt Road
September 25 December 11, 1985
Course Number: 106-401-307

Mon. & Wed., 7:00 9:40 p.m.
WCTI Downtown Campus
327 E. Broadway, Waukesha
September 23 October 30, 1985
Course Number: 106-401-308

OFFICE PERSONNEL WORKSHOP

- DESIGNED FOR:

  Improving your job performance by improving your interpersonal skills. Work skills are important, but you also need strong communication and time management skills to succeed. Text and workbook are required.

- MAJOR TOPICS:
  - Communicating effectively with your co-workers and supervisors
  - Developing a professional attitude
  - Motivating yourself to high achievement
  - Managing your time and your future
- SESSIONS: (12)

  Mondays, 6:30 8:30 p.m.
  September 23 December 9, 1985
- FEE: $15.05
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO-128
- COURSE NUMBER: 196-465-001

WORD PROCESSING SKILLS TRAINING

- DESIGNED FOR:

  The person who can already type 45 words per minute and wants to learn word processing skills. Enroll in convenient day or evening classes.

- MAJOR TOPICS:
  - Working with dedicated word processors and personal computers
  - Usage of word processing software
  - Creating, editing, and storing documents on the Wang, IBM PC, or IBM Displaywriter equipment
- FEE: $21.60
- SESSIONS/COURSE NUMBERS:

Mondays & Wednesdays
8:30 11:20 a.m., Room B-109
September 9 October 6, 1985
Course Number: 106-424-305

Mondays & Wednesdays
8:30 11:20 a.m., Room B-109
October 21 November 27, 1985
Course Number: 106-424-306

Tuesdays & Thursdays
11:30 2:20 p.m., Room B-109
September 10 October 17, 1985
Course Number: 106-424-307

Tuesdays & Thursdays
11:30 2:20 p.m., Room B-109
October 22 December 3, 1985
Course Number: 106-424-308

Fridays
8:30 11:20 p.m., Room B-104B
September 20 December 13, 1985
Course Number: 106-424-309

Fridays
11:30 2:20 p.m., Room B-104B
September 20 December 13, 1985
Course Number: 106-424-310

Saturdays
8:00 12:00 noon, Room B-109
Course Number: 106-424-311

Mondays
6:30 9:20 p.m., Room B-104B
September 9 November 26, 1985
Course Number: 106-424-321

Tuesdays
6:30 9:20 p.m., Room B-109
September 10 November 26, 1985
Course Number: 106-424-313

Wednesdays
6:30 9:20 p.m., Room B-109
September 11 November 27, 1985
Course Number: 106-424-314

Thursdays
6:30 9:20 p.m., Room B-104B
September 12 December 5, 1985
Course Number: 106-424-315

- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Business Occupations Bldg.

OTHER OFFICE SKILLS COURSES

106-407	Shorthand Review Workshop
106-412	ABC Shorthand/Speedwriting
106-431	Beginning Typing
106-432	Intermediate Typing
106-434	Speedtyping Techniques

TO REGISTER: CALL 691-2010
FOR MORE INFORMATION CALL 691-5255

SMALL BUSINESS CLASSES

TAX CONSIDERATIONS FOR SMALL BUSINESSES

- DESIGNED FOR:

  People who already own a small business or have some business tax experience and need more information on small business tax matters.
- MAJOR TOPICS:
  - Tax obligations, planning and alternatives
  - Tax reporting
  - Ordinary and ACRS depreciation
  - Investment tax credits
  - Inventory valuation
  - Travel and entertainment deductions
  - Retirement planning
- SESSIONS: (2)

  Wednesdays, 7:00 9:40 p.m.
  November 13 20, 1985
- FEE: $5.25
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 210
- COURSE NUMBER: 101 407 001

START YOUR OWN BUSINESS

- DESIGNED FOR:

  Anyone considering starting their own business. To succeed at business it takes more than a good idea. In this course you will learn what it takes to successfully start and manage a small business.
- MAJOR TOPICS:
  - Evaluating your idea and chances for success
  - Estimating start up costs and requirements
  - Why businesses fail
  - How to use bankers, attorneys, accountants and insurance people to start up and operate your business
- SESSIONS: (6)

  Tuesdays, 7:00 9:40 p.m.
  September 24 October 29, 1985
- FEE: $11.80
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Business Occupations Bldg.
  Room B 202
- COURSE NUMBER: 102 411 001

LEGAL CONSIDERATIONS FOR SMALL BUSINESS I

- DESIGNED FOR:

  Those who are considering a small business or have already started one. Plan for a profitable future by building your business on a firm foundation of legal understanding.
- MAJOR TOPICS:
  - The forms of business ownership
  - Designing contractual agreements
  - Setting up credit and collections procedures
- SESSIONS: (3)

  Thursdays, 6:30 9:30 p.m.
  September 19 October 3, 1985
- FEE: $7.45
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 223
- COURSE NUMBER: 102 421 001

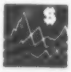
LEGAL CONSIDERATIONS FOR SMALL BUSINESS II

- DESIGNED FOR:

  Anyone needing more legal information about operation of his or her business.
- MAJOR TOPICS:
  - The source of law
  - Contract law
  - Sales law
  - Warranties and insurance
  - Wisconsin consumer law
  - Business concepts and organization
  - Trademarks, copyrights and patents
- SESSIONS: (3)

  Thursdays, 6:30 9:30 p.m.
  October 17 31, 1985
- FEE: $7.45
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 223
- COURSE NUMBER: 102 423 001



ADVERTISING & PROMOTION FOR SMALL BUSINESS

- DESIGNED FOR:

  The small business owner who is also his or her own advertising manager. Learn how you can effectively promote your products and services even on a limited budget.
- MAJOR TOPICS:
  - Creating a company identity
  - Promotional methods
  - Using demographic data
  - Budgeting for the advertising and promotional campaign
  - How to use print, broadcast and direct mail media
- SESSIONS: (6)

  Thursdays, 7:00 9:40 p.m.
  November 7 December 19, 1985
- FEE: $11.80
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 223
- COURSE NUMBER: 102 434 001

OTHER SMALL BUSINESS CLASSES

101 403	**Bookkeeping for Small Business**
101 405	**Payroll Tax Workshop**
101 407	**IRS Small Business Tax Workshop**
104 403	**Retail Cashier Checker Training**
109 400	**Travel Business Training**

TO REGISTER: CALL 691 2910
FOR MORE INFORMATION: CALL 691 5255

"The entire small business program at WCTI is excellent. I have taken a few classes and lectures directed at small businesses. All have been very helpful in my manufacturing business."

Daniel E. Wandler
Contour Tool & Stamping Inc.

"Both small business courses taken by my wife and myself were very inspirational and educational. They were a great help in establishing our small business."

Jeff Timm
Vista Inc.

STATISTICAL PROCESS CONTROL

MANAGING WITH STATISTICAL PROCESS CONTROL

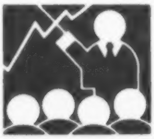
- DESIGNED FOR:

  Managers, supervisors and business owners who want to use statistical process control in their management system to reduce productivity inhibitors and enhance quality. For example, when integrated into the management system, statistical process control, as described in this course, meets the requirements established and imposed upon the suppliers by the big three auto manufacturers. The basic statistical tools were recommended and the management philosophy espoused by Dr. W. Edward Deming. Their increases in productivity, quality products and competitive position have been attributed by Japanese industrial leaders to their close adherence to statistical process control advocated by Dr. Deming. Participants will develop their own project using fundamentals of the course. Of the sixty hours in the course, twelve hours are devoted to the interpretation of the results of the self selected projects. This course is endorsed by the American Society for Quality Control.

- MAJOR TOPICS:
  - Group problem solving
  - Process flow charting
  - X R charting and interpreting
  - Variables and attributes charting
  - Statistical diagnosis and capability indexing
- AVAILABILITY:

  Upon request this course may be conducted by a WCTI instructor at your business site and at a time convenient to you. The field tested curriculum was developed by the Jackson (Michigan) Community College and the Ford Motor Company. For information, please call Ralph Spaulding at 691 5249.

- COURSE NUMBER: 623 427



"WCTI has done a superb job assisting our company with its supervisory training program. The in house training our supervisors have received has not only been convenient, but most effective. The changes that I have seen in the attitudes of our supervisors is very gratifying. I look forward to continuing our training relationship with WCTI for a long time to come."

Glenn W. Carlton
Vice President of Manufacturing
Western States Envelope Company

SUPERVISORY TRAINING

INTRODUCTION TO SUPERVISORY TECHNIQUES

- DESIGNED FOR:

  First line supervisors who need an introduction to basic management skills. You too can learn the skills necessary to effectively manage yourself and others.

- MAJOR TOPICS:
  - Leadership styles
  - Effective communication
  - Motivating and organizing people
  - Decision making, time management and goal setting
  - Training others
  - Performance appraisals and constructive criticism
  - Conflict resolution
  - Stress management
- SESSIONS: (10)

  Wednesdays, 7:00 9:40 p.m.
  September 25 November 27, 1985

- FEE: $18.30
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 128

- COURSE NUMBER: 196 429 001

TAILORED SUPERVISORY AND MANAGEMENT PROGRAMS

- DESIGNED FOR:

  The organization that needs effective supervisory and managerial personnel. WCTI will tailor courses to the specific needs of your organization whether it is a business, industry, government agency, educational institution or any other formally managed group. Courses can be presented at our campus or on your site, at a time convenient to you.

- MAJOR TOPICS:
  - Leadership
  - Human relations
  - Problem solving and decision making
  - Delegating work
  - Time management
  - Performance appraisals
  - Conflict resolution
  - Stress management
- CONTACT:

  Business Occupations
  691 5240 or 691 5255

8

INDUSTRIAL CLASSES

ROBOTICS I

- DESIGNED FOR:

  The production worker, supervisor or engineer who works with or wants to understand the basic design and purpose of an industrial robot. Building on this introductory course, advanced classes also include hands on programming and operation of robots. Textbook is required.

- MAJOR TOPICS:
  - Robot components and characteristics
  - Structural and functional differences
  - Improving productivity, product quality, personnel safety and operations flexibility with robots
- SESSIONS: (8)

  7:00 9:40 p.m.

- FEE: $15.05
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Industrial Occupations Bldg.
  Room I 136

  Wednesdays
  COURSE NUMBER: 620 401 002
  OR
  Mondays
  COURSE NUMBER: 620 401 003

SHOP INSPECTION

- DESIGNED FOR:

  The employee who inspects manufactured products for tolerance conformance. Learn to accurately and quickly check products using the latest measurement equipment.

- MAJOR TOPICS:
  - Reading blueprints
  - Inspection techniques
  - Using the micrometer
  - Using and maintaining inspection equipment
- SESSIONS: (8)

  Tuesdays, 7:00 9:40 p.m.
  September 24 November 12, 1985

- FEE: $19.05
- LOCATION:

  Menomonee Falls Thomas Jefferson School
  W165 N8301 La Vergne Avenue

- COURSE NUMBER: 420 425 300

ELECTRICAL MAINTENANCE FOR INDUSTRY

- DESIGNED FOR:

  Industrial maintenance personnel who do the electrical work for their companies. Learn the right way to install and repair electrical equipment.

- MAJOR TOPICS:
  - Electrical circuitry
  - Fuses and circuit breakers
  - Installing lighting, power and control panels
  - Electric motor design
  - Troubleshooting electrical failures
  - Using general and specialized electrical tools
- SESSIONS: (12)

  Mondays, 7:00 9:40 p.m.
  September 16 December 2, 1985

- FEE: $21.60
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Science Bldg.
  Room S 112

- COURSE NUMBER: 414 430 001

BOILER OPERATION AND MAINTENANCE

- DESIGNED FOR:

  Apartment managers, power plant personnel and maintenance people who need to understand, operate and maintain commercial and industrial boilers. This course will be useful to those seeking the Low or High Pressure Boiler Operator's License.

- MAJOR TOPICS:
  - Principles of steam and combustion engineering
  - Boiler construction
  - Boiler operation and maintenance
  - Using and maintaining pumps, valves and controls
- SESSIONS: (15)

  Wednesdays, 7:00 9:40 p.m.
  August 28 December 4, 1985

- FEE: $27.00
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Industrial Occupations Bldg.
  Room I 123

- COURSE NUMBER: 435 416 001

FUNDAMENTALS OF REFRIGERATION

- DESIGNED FOR:

  Anyone wanting to learn the basics of refrigeration technology. This is the first of a three course series on the subject. A text and workbook are required.

- MAJOR TOPICS:
  - Basic use of fittings and tubing
  - Rotary and reciprocating compressors
  - Valves, gages and metering devices
  - Refrigerants and oils
  - Electrical control circuits
  - Domestic hermetic servicing
- SESSIONS: (16)

  7:00 9:40 p.m.
  Register for lecture and one lab
  August 21 December 4, 1985

- FEE: $67.20

  (Includes lecture and lab)

- LOCATION/COURSE NUMBER:

  WCTI Pewaukee Campus
  800 Main Street

Lecture: Wednesdays
Science Bldg., Room S 206
COURSE NUMBER: 401 400 001

Lab: Tuesdays
Industrial Occ. Bldg., Room I 119
COURSE NUMBER: 401 400 300
OR
Mondays
COURSE NUMBER: 401 400 301

In addition, we offer:

401 401	Refrigeration Service II
401 403	Refrigeration Service III
401 407	Residential Heat Service
413 478	Electrical Code
414 407	Basic Electronics
435 417	Boiler Operation and Maintenance II
620 402	Robotics II
620 403	Robotics III

TO REGISTER: CALL 691 2910
FOR MORE INFORMATION: CALL 691 5255

COMMUNICATION CLASSES

BUSINESS WRITING

- DESIGNED FOR:

  Managers, clerical staff and other business people who want to learn to write more clearly and effectively. If a blank sheet of paper threatens you, you need this course to teach you specific writing skills and boost your writing confidence.

- MAJOR TOPICS:
  - How to write simply, clearly and directly
  - Saying things concisely
  - Writing effective memos, letters and reports
- LOCATION/SESSION/FEE/ COURSE NUMBER:

Tuesdays, 6:45 9:15 p.m., $10.70
WCTI Pewaukee Campus
800 Main Street
Business Occupations Bldg.
Room B 228
October 22 November 26, 1985
Course Number: 801 454 001

Tuesdays, 7:00 9:00 p.m., $10.70
Mukwonago High School
605 School Road
September 24 November 12, 1985
Course Number: 801 454 002

Mondays, 7:00 9:00 p.m., $8.55
Brookfield Central High School
16990 Gebhardt Road
September 23 October 28, 1985
Course Number: 801 454 003

EFFECTIVE LISTENING

- DESIGNED FOR:

  Managers, supervisors, or salaried workers who want to communicate better in the workplace and in their personal lives. Half of communication is listening, and listening is a skill you can improve. This practical course will give you a chance to use and practice effective listening techniques.

- MAJOR TOPICS:
  - How to hear what the other person is saying
  - Identifying feedback techniques
  - Practice using those techniques
- SESSIONS: (4)

  Wednesdays, 7:00 9:00 p.m.

- FEE: $6.35
- LOCATION:

WCTI Pewaukee Campus
800 Main Street
Service Occupations Bldg.
Room SO 120
October 30 November 20, 1985
Course Number: 801 437 001

New Berlin High School
18695 W. Cleveland Avenue
September 25 October 16, 1985
Course Number: 801 437 002

EFFECTIVE PRESENTATION — PUBLIC SPEAKING

- DESIGNED FOR:

  Anyone who makes business presentations or speaks to groups.

- MAJOR TOPICS:
  - Presenting business ideas simply and concisely
  - Getting your listener to respond
  - How to present yourself effectively in an interview
  - Non verbal communication using your body to speak the message
- SESSIONS: (8)

  7:00 9:00 p.m.

- FEE: $10.70
- LOCATION:

Thursdays
Mukwonago High School
605 School Road
September 26 November 14, 1985
Course Number: 801 423 001

Mondays
Brookfield Central High School
16990 Gebhardt Road
September 23 November 11, 1985
Course Number: 801 423 002

PUBLIC SPEAKING — VIDEO METHOD

- DESIGNED FOR:

  Anyone whose knees have quivered or whose tongue tied itself in knots when speaking before a group. By seeing yourself on video tape, you will increase your skill and confidence so you can give effective speeches and business presentations.

- MAJOR TOPICS:
  - How to structure a good speech or presentation
  - Working from an outline
  - How to use visual aids effectively
  - Analyzing your performance on video tape
- SESSIONS: (8)

  Thursdays, 7:00 9:00 p.m.
  September 26 November 14, 1985

- FEE: $10.70
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 117

- COURSE NUMBER: 801 445 001

Also offered are foreign languages classes in:

Spanish Italian
German Chinese
French

TO REGISTER: CALL 691 2910
FOR MORE INFORMATION: CALL 691 5255

"The WCTI customized Human Relations course was a valuable tool producing significant positive changes at Process Displays. This course was tailored to our needs. WCTI staff met with us and interviewed our staff so that the content would be based on our real work environment and our employees' needs. The instructor addressed the practical application using case studies from our industry so the skills my employees learned were relevant."

Tom Pendleton
Vice President, General Manager
Process Displays

COMMUNICATION CLASSES

SPEED READING

- DESIGNED FOR:

  Anyone who wants to increase their reading rate and degree of comprehension. You will become a more efficient reader by learning to vary your reading speed and comprehension with the type of material.

- MAJOR TOPICS:
  - How to increase reading rate
  - How to improve comprehension
  - Increasing visual span of recognition
  - Developing flexibility in your comprehension rate
- SESSIONS: (10)

  7:00 9:00 p.m.
- FEE: $12.90
- LOCATION/COURSE NUMBER:

Wednesdays
Brookfield Central High School
16990 Gebhardt Road
September 25 November 27, 1985
Course Number: 808 431 300

Thursdays
Mukwonago High School
605 School Road
September 26 December 5, 1985
Course Number: 808 431 301

Tuesdays
Hamilton High School
W220 N6151 Town Line Road
September 24 November 26, 1985
Course Number: 808 431 302

HUMAN RELATIONS FOR SUPERVISORS

- DESIGNED FOR:

  Anyone who supervises or manages people in the workplace. No matter what area you supervise, this course will sharpen your skills, help you understand the people you manage, and help you communicate better with them.

- MAJOR TOPICS:
  - Organizational communication how to remove communication blocks
  - How to blend and balance the talents of your people to form an effective team
  - How to deal with conflict through constructive confrontation
  - Accepting and managing change as a positive force in the workplace
- SESSIONS: (10)

  Mondays, 7:00 9:00 p.m.
  September 23 November 25, 1985
- FEE: $12.90
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 120
- COURSE NUMBER: 801 457 001

IMPROVE YOUR THINKING POWER

- DESIGNED FOR:

  The person who wants to increase their ability to think analytically. Learn to use a systematic, organized approach in your thinking process.

- MAJOR TOPICS:
  - Using an organized approach for deductive reasoning, problem solving and mathematical skills
  - How to read technical material more easily
  - Reasoning logically
  - How to increase your vocabulary
  - How to strengthen your memory skills
- SESSIONS: (10)

  Mondays, 5:30 7:30 p.m.
  September 23 November 25, 1985
- FEE: $12.90
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO 223
- COURSE NUMBER: 804 416 001

> *"I started utilizing WCTI for some of our on site training because it was cost effective to do so. However, I have continued and expanded our working relationship with WCTI because of the high quality instruction."*
>
> Ed Marshman
> Corporate Training Coordinator
> RTE Corporation

DEALING WITH CONFLICT IN THE WORKPLACE

- DESIGNED FOR:

  Managers or staff who want to improve their productivity and make their workplace more pleasant. Learn to handle the inevitable conflicts that happen in every office, both between peers and between staff and boss.

- MAJOR TOPICS:
  - Seeing the difference between misunderstanding and conflict
  - Recognizing sources of conflict
  - Analyzing approaches to confronting and resolving conflicts
  - Communicating and being sensitive to other's needs
  - Giving and receiving criticism
  - How to compromise
- SESSIONS: (3)

  Wednesdays, 5:30 9:30 p.m.
  October 9, 23, 30, 1985
- FEE: $38.55

  (Includes tuition, materials, 3 dinners)
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Student Commons Bldg.
  Fireside Lounge
- COURSE NUMBER: 809 459 001

Also offered:

801 447	Voice and Diction
801 440	Conducting Effective Meetings
809 434	How to Make the Most of your Performance Appraisal
801 496	Leadership Attitudes and Skill Training

TO REGISTER: CALL 691 2910
FOR MORE INFORMATION: CALL 691 5255

CONSUMER & HEALTH EDUCATION CLASSES

FINANCIAL PLANNING

- DESIGNED FOR:

  People who want to make the most of their investments by understanding all the choices open to them. The class will focus on why many people reach retirement financially unprepared, and how you can avoid being among them.
- MAJOR TOPICS:
  - An overview of financial planning
  - The impact of inflation and taxes
  - Fixed instruments
  - Risk management
  - Stocks and mutual funds
  - Estate planning
  - Tax shelters
- SESSIONS: (6)

  Tuesdays, 7:00-9:00 p.m.
  November 12 - December 17, 1985
- FEE: $8.55
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Business Occupations Bldg.
  Room B-202
- COURSE NUMBER: 308-401-004

LATER LIFE HEALTH ISSUES

- DESIGNED FOR:

  Older people who want to understand the health problems common in later life and how to deal with them.
- MAJOR TOPICS:
  - The normal aging process
  - Nutrition for the older person
  - First aid
  - Coping with chronic illness
  - Over the counter and prescription drugs
- SESSIONS: (6)

  Tuesdays, 4:30-6:30 p.m.
  September 24 - October 29, 1985
- FEE: $8.55
- LOCATION:

  WCTI Pewaukee Campus
  800 Main Street
  Service Occupations Bldg.
  Room SO-116
- COURSE NUMBER: 534-429-001

RETIREMENT PLANNING

- DESIGNED FOR:

  People age 50 and over who want to be sure their retirement years are happy and productive through advance planning. The course is for both singles and couples. Using resource people from the community and group discussions, this class offers you a chance to plan your retirement and shape it to meet your needs.
- MAJOR TOPICS:
  - Midlife goals and roles
  - Use of leisure time
  - Health and fitness
  - Housing alternatives
  - Legal matters
  - Financial and estate planning
- SESSIONS: (8)

  7:00-9:00 p.m.
- FEE: $10.70
- LOCATION/COURSE NUMBER:

Mondays
WCTI Pewaukee Campus
Science Bldg., Room S-205
September 9 - October 28, 1985
Course Number: 308-472-001

Wednesdays
New Berlin High School
18695 W. Cleveland Avenue
September 25 - November 13, 1985
Course Number: 308-472-002

"The biggest benefit to us is the top quality health care instruction we receive from WCTI ... Having the courses offered here, on site, is a great benefit to us ... It gives us flexibility ... We can schedule classes any time of day — from noon to three, from three to six, or even in the evening ... WCTI draws on people who are experienced specialists in their fields, so we get top quality instructors. I meet with the WCTI coordinator to express what we want, and the instructors work with us to tailor a program specifically designed to meet our needs."

Noreen Lyons
Inservice Coordinator
Elmbrook Memorial Hospital

FAMILY HEALTH ISSUES

- DESIGNED FOR:

  People who want to live longer, healthier lives. This class will make you aware of healthier life styles and what you can do to take charge of your own health.
- MAJOR TOPICS:
  - Nutrition
  - First aid
  - Allergies
  - Coping with chronic illness
  - Drug awareness
- SESSIONS: (6)

  Tuesdays, 7:00-9:00 p.m.
  September 24 - October 29, 1985
- FEE: $8.55
- LOCATION:

  WCTI Pewaukee Campus
  Service Occupations Bldg.
  Room SO-116
- COURSE NUMBER: 534-428-001

OTHER HEALTH OCCUPATIONS COURSES

Classes for various health personnel are held on the Pewaukee Campus but may be scheduled on site for specific agencies. Examples are:

Physical Assessment for RNs
IV Therapy & Techniques for RNs
Maintaining IVs for LPNs
Leadership Skills for LPN Charge Nurses
Pharmacology Update
Communication Skills

TO REGISTER: CALL 691-2910
FOR MORE INFORMATION: CALL 691-5255

An outstanding example of cooperation between a local nursing home and WCTI is Woodland Health Center. Rita Burger, In-service Director for that agency, has scheduled eleven different educational offerings for her staff during the past school year. Members of her staff pay the fees themselves and eagerly await new sessions to be held. Her staff is updated on new technology and methods and Mrs. Burger is successful in motivating them to participate voluntarily. She has high standards for her in-service program and has expressed great satisfaction with WCTI.

ACADEMIC SUPPORT SERVICES

Improve job performance by offering your employees the opportunity for successful learning. Meeting the ever changing educational needs of individuals both in and preparing for the competitive world of work is a major goal of WCTI's Academic Support Department. Bringing the many support services at any one of WCTI's campuses is rewarding for both employer and employee.

The Academic Support Department provides four services which can be tailored to the individual, business or industry.

THE LEARNING PLACE

- DESIGNED FOR:

  Designed for the general public the Learning Place and associate Learning Centers at the Waukesha and Menomonee Falls Campuses provides students and public with a place to review, relearn, or improve basic academic skills.

- MAJOR TOPICS:
  - Credit courses in reading, math and writing
  - Academic support in science areas
  - Pre-technical preparation
  - Tutoring
  - Special academic support if disabled
  - Preparation for GED
  - Learn study and test taking skills
  - Improve spelling vocabulary
  - Prepare for special licensing or entrance exam
  - Take self assessment in reading, math and writing

For more information, contact Judy Jorgensen at 691 5392.

ESL: ENGLISH AS A SECOND LANGUAGE

- DESIGNED FOR:

  For some foreign born employees, limited English language skills can affect job efficiency. Emphasizing both spoken and written language skills, ESL classes assist the limited English speaking person adapt more successfully on the job and in our society.

  Professional staff within ESL have served participants from around the world — France, Germany, Poland, India, Laos, Vietnam, Spain, Mexico, and many more.

For more information, contact:
ESL Program
Downtown Waukesha Campus
521 5190
OR
ESL Program
Menomonee Falls Campus
255 4351

ADULT BASIC EDUCATION (ABE)

- DESIGNED FOR:

  Designed for adults with limited educational backgrounds, WCTI's ABE or Goal Oriented Adult Learning (GOAL) programs provide basic skill classes, high school completion programs (e.g., Adult High School, External High School Program and G.E.D.), self improvement activities and a wide range of career education offerings.

  WCTI's Adult Basic Education offerings are available on all three campuses. Customized ABE services such as developing fundamental reading, math and writing skills can be brought on-site to benefit a number of employees.

For more information, contact:
GOAL Program
Downtown Waukesha Campus
521 5190
OR
GOAL Program
Menomonee Falls Campus
255 4351

PATHS: PRE ACADEMIC TECHNICAL HIGHWAY TO SUCCESS

- DESIGNED FOR:

  Individuals removed from the "formal" academic setting for any number of years will need the assistance to review skills and become competitive once again in the school setting. Assisting the individual emotionally and academically PATHS prepares the person to be successful in their educational endeavors.

  Offering short term review in Algebra, Chemistry, Geometry, Physics, Reading Vocabulary, and study skills individuals learn how to return to the study mode. In addition to introductory studies in electricity and general science individualized services are available in areas ranging from arithmetic to vocabulary.

For more information, contact PATHS at 691 5318.

"Being a small hospital, Rogers Memorial is unable to afford the investment needed to produce many of the high quality programs we desire for our staff. Therefore, it has been helpful to call upon WCTI for training programs. We appreciate the institution's prompt attention, willingness to tailor programs to our needs, and the reasonable cost."

Colleen W. Gorrilla, RN
Inservice Director
Rogers Memorial Hospital

CAREER SUPPORT SERVICES

PLACEMENT SERVICES

Each year hundreds of employers utilize the WCTI Placement Center to fill their employment needs. Acting as a "clearing house" for jobs submitted by area businesses, industries, organizations and individuals, the WCTI Placement Center has the ability to classify, computerize and advertise available positions. Qualified WCTI students and graduates are referred to fill these full and part time positions.

Fully appreciating the complexity of today's labor market and labor needs, the WCTI Placement Center employs computerized job matching as well as cooperative arrangements with other placement agencies, including Wisconsin Job Service.

Discover the placement potential of WCTI's Placement Center.

For more information, contact the WCTI Placement Center at 691-5220.

THE CAREER CENTER

Uncovering new and expanding present career opportunities is the goal of The Career Center. Serving the entire district —individuals, businesses and industries — The Career Center stands ready to meet a wide range of career and employment needs.

Employers and employees may take advantage of The Career Center's professional staff and range of specialized career services developed by WCTI. Workshops covering topics in career exploration through career change are available. Additionally, is a library of more than 500 career and occupational resources. The Career Center has an extensive library of employment, interest, and ability assessment instruments, performance test devices, specially designed microcomputer application programs and mainframe options to assist individuals and groups in obtaining reliable career and occupational information.

Unlock your employees' potential, let them discover where their talents lie, where their abilities will lead them and where you as an employer can help them reach full potential.

For more information, contact The Career Center at 691-5287.

PROJECT COPE (CAREER OPTIONS FOR PEOPLE WITH EXPERIENCE)

Economic and technological changes have forced many employers to reduce or modify their labor force. If your company is reducing or modifying its labor force WCTI has the trained professional staff to assist you in this difficult time. Through proven, structured outplacement services designed for success, WCTI's Project COPE staff can assist affected employees in the entire re-employment process.

In addition to individualized services, COPE provides customized re-employment or outplacement services. Workshops developed for the dislocated worker include: Emerging Occupations: Labor Outlooks Nationally and Locally; Surviving the Job Campaign; Assessment for Re-employment or Retraining; and Job Shop: Job Seeking in Today's Labor Market.

WCTI's proven professional services through Project COPE can be customized to meet the needs of your company and affected employees.

For more information, contact Project COPE at 691-5306.

"The Career Center provided a relaxed atmosphere with individual attention. The information I obtained was extremely helpful in defining who I am, and where my skills, interests, and personal style fit into my employment environment."

"The WCIS Computer system was responsible for my knowing the job I applied for. I had an interview, and was offered the job."

COOPERATIVE EDUCATION

Employers and students benefit from the cooperative education opportunities available through WCTI. Supervised work study allows business to employ qualified associate degree students in jobs directly related to the students' academic majors. Reduction of personnel costs, prescreened applicants, no recruitment or fringe benefit costs are only four of the many benefits realized by the employer.

Cooperative Education (Co-op) students can fill short term employment needs, fill in for summer vacations, or be hired to complete special projects. As an employer you can discover the hidden talents of students enrolled in programs such as: Accounting, Business Data Processing, Administrative Assistant/Secretarial, Marketing, Fashion Merchandising, Retailing, Food Marketing, Property Assessment, Police Science, Electronics, Electronic Circuit Board Design, Food Helper and the Automotive Servicing Education Program (ASEP).

For more information, contact the Cooperative Education Office at 691-5477.

"On behalf of the Medical Systems Business Group, IAM Lodge 1916-78 and many production employees, we would like to personally thank you for your timely and efficient response in facilitating an out-placement service for our hourly employees."

G.E. Medical Systems Group

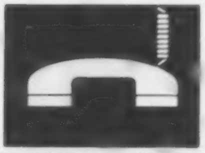
"In each interview I felt I had a definite advantage because of your expertise and assistance. With every question asked, I had an answer that reinforced my career goals and experience. Thanks again for your help, your program certainly has my endorsement!"

Anthony Ferraro

"It's really great to have solid control! I want to thank you again for your professional assistance and that of your associates. I'm sure that without it, the results achieved to date would be significantly different."

Peter Kramer

REGISTRATION INFORMATION



TO REGISTER BY TELEPHONE FOR CLASSES, CALL 691 2910.

FOR INFORMATION ON ECONOMIC DEVELOPMENT AND WCTI SERVICES, CALL 691 5255

FOR COURSE INFORMATION, CALL 691 5578.

HOW TO REGISTER

Register by telephone for all courses. Call 691 2910.

HOURS

Telephone Registration Hours:
Monday through Thursday
8:30 a.m. to 4:00 p.m.
Friday
8:30 a.m. to 3:00 p.m.

Call 691 2910

BEFORE YOU CALL

Please have the following information ready:

A. Social Security Number
B. Name
C. Address
D. Phone Number
E. Date of Birth
F. Course Number (For example: 101 115 650 Accounting
G. Employment Information

Please do not call the main Switchboard but use this special telephone registration number — 691 2910.

Your class schedule and invoice for tuition and fees will be mailed to you within one day. Please return your check to WCTI in the envelope provided as soon as you receive your fee statement.

YOUR CHECK MUST BE RECEIVED WITHIN 5 DAYS OR YOUR REGISTRATION WILL BE AUTOMATICALLY CANCELLED.

Money received after 5 days will be returned to sender. If you are still interested in the course, you will have to re-register.

PLEASE REFER TO THE START DATE LISTED FOR ALL CLASSES.

$ $

TUITION AND REFUND SCHEDULE

Except in the case of cancellation or discontinuance of courses, the student must request the refund through the Registration Office. PLEASE NOTE that all requests for 100% refunds must be made to the Registration Office prior to the opening day of the semester. Refunds will be processed according to the following schedules for courses offered on a semester basis:

Days of Withdrawal	% Fee Refunded Minus $3.00
1-14	80%
15-28	60%
29 or more	0%

Refund policy for short term courses (courses not offered on a semester basis):

% of Hours of Instruction Completed	% of Fee Refunded Minus $3.00
10%	80%
11%-25%	50%
more than 25%	0%

NOTE: A $3.00 processing fee will be deducted from the above amounts. Written requests are required for all refunds when a student drops a class. Classes with insufficient enrollment may be cancelled by WCTI, and all fees will be refunded.

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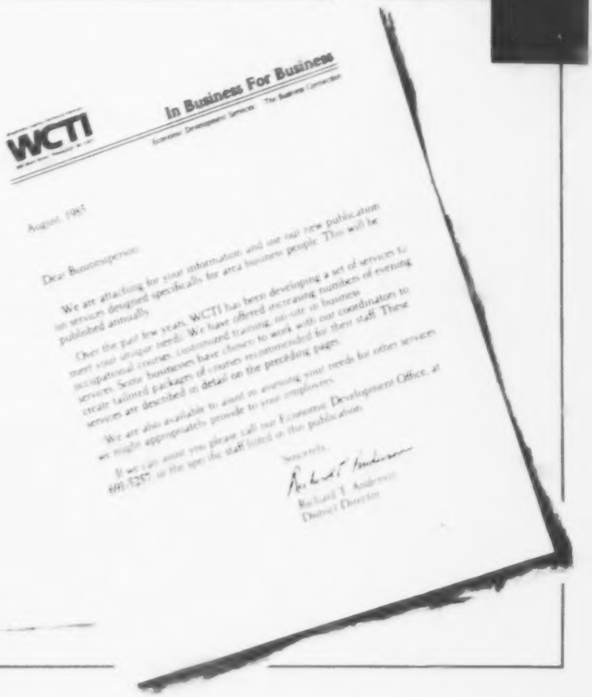
"Other companies will sell you a training package ... but WCTI asked us what we wanted to accomplish and tailored the course to meet our needs ... We can't get that from anyone else. And the cost is reasonable."

Ken Kanack
Operations Manager
Ortho Kinetics



WCTI

In Business For Business

Economic Development Services · The Business Connection

August, 1985

Dear Businessperson:

We are attaching for your information and use our new publication on services designed specifically for area business people. This will be published annually.

Over the past few years, WCTI has been developing a set of services to meet your unique needs. We have offered increasing numbers of evening occupational courses, customized training, on-site in business services. Some businesses have chosen to work with our coordinators to create tailored packages of courses recommended for their staff. These services are described in detail on the preceding pages.

We are also available to assist in assessing your needs for other services we might appropriately provide to your employees.

If we can assist you please call our Economic Development Office, at 691-5257 or the specific staff listed in this publication.

Sincerely,

Richard T. Anderson

Richard T. Anderson
District Director

Waukesha County Technical Institute
WCTI
800 Main Street, Pewaukee, WI 53072
THE BUSINESS CONNECTION
In Business For Business

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Pewaukee, WI 53072

Mr. **Walgren**. Thank you very much, Dr. Anderson. Let's go then to Dr. Schafer.

Mr. **Schafer**. Chairman Walgren, and other members of the Science, Research and Technologies Committee.

My name is Michael Schafer. I am president of Mohawk Valley Community College with campuses in Rome and Utica, NY. Allow me first to express my sincere thanks for the chance to speak with you this morning.

I am especially pleased to be able to discuss H.R. 2353 with you because it focuses on programs which are at the core of our educational needs in the United States today. Without a highly skilled care of technically trained individuals, this Nation's industries have no hope of being able to compete successfully in today's world markets.

The bill's focus on 2-year community and technical colleges is also most appropriate. These uniquely American institutions are ideally suited to provide the training at the appropiate level for increasingly technological industrial applications. While I would not minimize the industrial need for engineers and those with advanced degrees, I note that most studies report that the successful contemporary industry will require between 7 and 14 technicians to support each engineer it employs.

Another high priority focus of the bill is for retraining and upgrading dislocated workers and unemployed adults. Unless these individuals are provided basic competencies as well as contemporary technical job skills, they will never escape from the descending spiral of unemployment and potential public dependence. And yet, while the purposes and programs described in H.R. 2353 are laudable, I would argue that these purposes could more effectively be met by administrative streamlining of, and additional funding for, existing programs with similar purposes.

While the Job Training Partnership Act, the Occupational Retraining and Reemployment Act, and the Trade Readjustment Act are far from perfect, I believe their refinement will be more productive in the long run than the creation of an additional program under the National Science Foundation or any other umbrella agency.

I am all too aware that the National Science Foundation apparently has not seen the community college as a priority institution since its inception. As argued so well in the statement of findings under H.R. 2353, community college technical programs are in an ideal position to meet critical national employment training needs. Our training programs are both effective and efficient. They have been, and are, created to meet specific local needs quickly.

We could do even more with additional funds for equipment, staff development of our maturing community college faculty and additional support for research, even if it is applied research, into how we can more effectively teach in these programs.

I certainly hope the National Science Foundation can be encouraged to place this Nation's community and technical colleges in a higher priority for allocations under existing National Science Foundation programs.

My concern is that they neither have the mission nor the expertise to deal with training or retraining programs, even with their strength of technical competency.

Perhaps it would be helpful for me to review briefly Mohawk Valley Community College's experience with ORRA, TRA and JTPA, which I believe are in a better position to meet the needs which this bill addresses. We currently serve hundreds of individuals throughout our district with the help of funding under the Occupational Retraining and Reemployment Act, Trade Readjustment Act and Job Training Partnership Act.

Under ORRA and TRA, individuals are referred to MVCC by the New York State Job Service. Under JTPA, they're sent to us by the Oneida-Madison-Herkimer Counties consortium. ORRA provides assistance to dislocated workers in training programs approved by the State education department in designated occupations. Each of these designated occupations is judged by State education officials as offering good local prospects for reemployment; the jobs are there.

We have more than 50 Oneida County residents enrolled in 10 different certificate programs under ORRA, including industrial and commercial electricity, applicance repair and refrigeration, electronics, accounting, bookkeeping, and even systems design.

The Trade Readjustment Act is for unemployed individuals whose former place of employment has been declared eligible, primarily as a result of adverse impacts from foreign competition. We currently are retraining former employees of Bossert Manufacturing and Revere Copper & Brass, for example. We expect to begin serving former employees of the Chicago Pneumatic Tool Co. in this next semester.

Under TRA, we have more than 30 students enrolled in certificate or associate degree programs. The curricula involved include air conditioning, civil, electrical, and mechanical engineering technology; data processing, electrical service technician, medical record technology, surveying and welding, as well as others.

Under JTPA, we participate widely as a cooperative partner in on-the-job training, and in class-size training for identified occpational needs. We participate on a competitive basis with other training providers in basic skill training for adults, whose inability to speak, read or write the English language, or handle mathematics, impairs their ability to get or keep a job. Frankly, these are frequently more pressing needs than the high technology skills.

We also provide preemployment skills training in job readiness and job search assistance in developing job seeking skills. So many of these individuals identify their personal sense of worth with the jobs they no longer have, that our intensive counseling programs are critical in helping them to maintain a sense of worth and dignity. These comprehensive approaches to rebuilding attitudes as well as skills are unfortunately difficult to structure under existing regulations.

As an institution, we try and broker these existing Federal programs along with State programs, such as New York's structural unemployment retraining program, which allows us to train people for identified openings in a variety of local industries.

This program makes it possible for us to pick up all training costs, while providing people with the necessary technical skills to take existing jobs. Through what is called contract course program in New York State, we are able to tailor specific instructional programs for area business and industry. With the Remington Arms Corp., for example, we have trained currently employed machinists to move into computer numerical control machining, improving company productivity, and protecting existing jobs. We have also trained area executives and mid-level managers in various aspects of efficient supervision, management and productivity involvement.

We work closely and successfully with our local Private Industry Council, and with a local liaison group known as the Industry-Labor-Education Council. Our college foundations sponsors a highly successful group for top management, called the Mohawk Executive Forum. Its activities include industry-specific roundtables between industrial managers and college officials.

Additional incentives for developing working relationships with business and industry, or for developing totally new certificate and degree programs, do not seem to be a priority need of our community colleges.

What is needed—and I suggest that they can best be developed by modifying existing programs rather than by creating a new program—are technical assistance to our colleges to insure that the technological programs we offer are state of the art, assistance in purchasing and upgrading the sophisticated and expensive equipment needed for training, and incentives to our instructors to continue upgrading their skills, rather than being placed in the lowest bid competitive situation as service providers, we should be encouraged financially to make our programs as strong and comprehensive as they possibly can be. When that has been accomplished, we should then be used extensively and aggressively by industry and government to provide much needed work force retraining.

For us in the Mohawk Valley, while we will continue working to create new jobs and bring in new industry, the maintenance and upgrading of existing jobs must assume an even higher priority. At the same time, we must reduce the paralyzing burden of paper work associated with existing programs. It's duplicative, confusing, and incredibly timeconsuming.

Well-meaning limitations on administrative costs prevent us from conducting the necessary staff and program development described in H.R. 2353. Current performance standards also ignore the need and potential for keeping existing jobs, for retraining and upgrading skills within our current industries in order to help them regain a competitive position in national and international markets.

Finally, one of my college's greatest problems as a service provider and one of the greatest problems faced by employers wishing to take advantage of existing job training programs, is program duplication and a serious lack of coordination between State, Federal, and local programs.

We were recently able to identify 21 different offices in our service area with the same specific responsibility of bringing together business, industry and education to develop a job force with better training and higher levels of technological skills, in order to further economic development. I would propose that we do not need to offer a 20-second program, but rather, fully fund, refine and coordinate what we already have.

Thank you.

[The prepared statement of Dr. Schafer follows:]

TESTIMONY BEFORE
THE SUBCOMMITTEE ON
SCIENCE, RESEARCH & TECHNOLOGY

U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON SCIENCE & TECHNOLOGY

MICHAEL I. SCHAFER, PRESIDENT
MOHAWK VALLEY COMMUNITY COLLEGE

NOVEMBER 19, 1985

CHAIRMAN WALGREN, CONGRESSMAN BOEHLERT & OTHER MEMBERS OF THE SCIENCE RESEARCH AND TECHNOLOGIES SUBCOMMITTEE:

ALLOW ME FIRST TO EXPRESS MY SINCERE THANKS FOR THE OPPORTUNITY TO SPEAK TO YOU THIS MORNING. I'M ESPECIALLY PLEASED TO BE ABLE TO DISCUSS HR 2353 WITH YOU BECAUSE IT FOCUSES ON PROGRAMS WHICH ARE AT THE CORE OF OUR EDUCATIONAL NEEDS OF THE UNITED STATES TODAY. WITHOUT A HIGHLY SKILLED CORE OF TECHNICALLY TRAINED INDIVIDUALS, THIS NATION'S INDUSTRIES HAVE NO HOPE OF BEING ABLE TO COMPETE SUCCESSFULLY IN TODAY'S WORLD MARKETS.

THE BILL'S FOCUS ON TWO-YEAR COMMUNITY AND TECHNICAL COLLEGES IS ALSO MOST APPROPRIATE. THESE UNIQUELY AMERICAN INSTITUTIONS ARE IDEALLY SUITED TO PROVIDE THE TRAINING AT THE APPROPRIATE LEVEL FOR INCREASINGLY TECHNOLOGICAL INDUSTRIAL APPLICATIONS. WHILE I WOULD NOT MINIMIZE THE INDUSTRIAL NEED FOR ENGINEERS AND THOSE WITH ADVANCED DEGREES, I NOTE THAT MOST STUDIES REPORT THAT THE SUCCESSFUL CONTEMPORARY INDUSTRY WILL REQUIRE BETWEEN SEVEN AND FOURTEEN TECHNICIANS TO SUPPORT EACH ENGINEER IT EMPLOYS.

ANOTHER HIGH PRIORITY FOCUS OF THE BILL IS FOR RE-TRAINING AND UPGRADING DISLOCATED WORKERS AND UNEMPLOYED ADULTS. UNLESS THESE INDIVIDUALS ARE PROVIDED BASIC COMPETENCIES AS WELL AS CONTEMPORARY TECHNICAL JOB SKILLS, THEY WILL NEVER ESCAPE FROM THE DESCENDING SPIRAL OF UNEMPLOYMENT AND POTENTIAL PUBLIC DEPENDENCE. AND YET WHILE THE PURPOSES AND PROGRAMS DESCRIBED IN HR 2353 ARE LAUDABLE, I WOULD ARGUE THAT THESE PURPOSES COULD BE MORE EFFECTIVELY MET BY ADMINISTRATIVE STREAMLINING OF, AND ADDITIONAL FUNDING FOR EXISTING PROGRAMS WITH SIMILAR PURPOSES. WHILE THE JOB TRAINING PARTNERSHIP ACT, THE OCCUPATIONAL RETRAINING AND REEMPLOYMENT ACT AND THE TRADE READJUSTMENT ACT ARE FAR FROM PERFECT, I BELIEVE THEIR REFINEMENT WILL BE MORE PRODUCTIVE IN THE LONG RUN THAN THE CREATION OF AN ADDITIONAL PROGRAM UNDER THE NATIONAL SCIENCE FOUNDATION OR ANY OTHER UMBRELLA AGENCY.

I AM ALL TOO AWARE THAT THE NATIONAL SCIENCE FOUNDATION APPARENTLY HAS NOT SEEN THE COMMUNITY COLLEGE AS A PRIORITY INSTITUTION FOR FUNDING SINCE ITS INCEPTION. AS ARGUED SO WELL IN THE STATEMENT OF FINDINGS UNDER HR 2353, COMMUNITY COLLEGE TECHNICAL PROGRAMS ARE IN AN IDEAL POSITION TO MEET CRITICAL NATIONAL EMPLOYMENT TRAINING NEEDS. OUR TRAINING PROGRAMS ARE BOTH EFFECTIVE AND EFFICIENT. THEY HAVE BEEN, AND ARE, CREATED TO MEET SPECIFIC LOCAL NEEDS QUICKLY. WE COULD DO EVEN MORE WITH ADDITIONAL FUNDS FOR EQUIPMENT, STAFF DEVELOPMENT OF OUR MATURING COMMUNITY COLLEGE FACULTY AND ADDITIONAL SUPPORT FOR RESEARCH, EVEN IF IT IS APPLIED RESEARCH INTO HOW WE CAN TEACH MORE EFFECTIVELY IN THESE PROGRAMS. I CERTAINLY HOPE THE NATIONAL SCIENCE FOUNDATION CAN BE ENCOURAGED TO PLACE THE NATION'S COMMUNITY AND TECHNICAL COLLEGES IN A HIGHER PRIORITY FOR ALLOCATIONS UNDER EXISTING NATIONAL SCIENCE FOUNDATION PROGRAMS.

MY CONCERN IS THAT THEY NEITHER HAVE THE MISSION NOR THE EXPERTISE TO DEAL WITH TRAINING OR RETRAINING PROGRAMS, EVEN WITH THEIR STRENGTH OF TECHNICAL COMPETENCY.

PERHAPS IT WOULD BE HELPFUL FOR ME TO REVIEW BRIEFLY MOHAWK VALLEY COMMUNITY COLLEGE'S EXPERIENCE WITH ORRA, TRA AND JTPA, WHICH I BELIEVE ARE IN A BETTER POSITION TO MEET THE NEEDS WHICH THIS BILL ADDRESSES. WE CURRENTLY SERVE HUNDREDS OF INDIVIDUALS THROUGHOUT OUR DISTRICT WITH THE HELP OF FUNDING UNDER THE OCCUPATIONAL RETRAINING AND REEMPLOYMENT ACT, TRADE READJUSTMENT ACT AND THE JOB TRAINING PARTNERSHIP ACT. UNDER ORRA AND TRA, INDIVIDUALS ARE REFERRED TO MVCC BY THE NEW YORK STATE JOB SERVICE. UNDER JTPA, THEY'RE SENT TO US BY THE ONEIDA-MADISON-HERKIMER COUNTIES CONSORTIUM. ORRA PROVIDES ASSISTANCE TO DISLOCATED WORKERS IN TRAINING PROGRAMS APPROVED BY THE STATE EDUCATION DEPARTMENT IN DESIGNATED OCCUPATIONS. EACH OF THESE DESIGNATED OCCUPATIONS IS JUDGED BY STATE EDUCATION OFFICIALS AS OFFERING GOOD LOCAL PROSPECTS FOR REEMPLOYMENT; THE JOBS ARE THERE.

WE HAVE MORE THAN FIFTY ONEIDA COUNTY RESIDENTS ENROLLED IN TEN DIFFERENT CERTIFICATE PROGRAMS UNDER ORRA, INCLUDING INDUSTRIAL AND COMMERCIAL ELECTRICITY, APPLIANCE REPAIR AND REFRIGERATOR, ELECTRONICS, ACCOUNTING, BOOKKEEPING AND SYSTEMS DESIGN.

THE TRADE READJUSTMENT ACT IS FOR UNEMPLOYED INDIVIDUALS WHOSE FORMER PLACE OF EMPLOYMENT HAS BEEN DECLARED ELIGIBLE, PRIMARILY AS A RESULT OF ADVERSE IMPACTS FROM FOREIGN COMPETITION. WE CURRENTLY ARE RETRAINING FORMER EMPLOYEES OF BOSSIRT MANUFACTURING AND REVERE COPPER & BRASS FOR EXAMPLE. WE EXPECT TO BEGIN SERVING FORMER EMPLOYEES OF THE CHICAGO PNEUMATIC TOOL COMPANY IN THE NEXT SEMESTER. UNDER TRA, WE HAVE MORE THAN THIRTY STUDENTS ENROLLED IN CERTIFICATE AND ASSOCIATE DEGREE PROGRAMS. THE CURRICULA INVOLVED INCLUDE AIR CONDITIONING; CIVIL, ELECTRICAL AND MECHANICAL ENGINEERING TECHNOLOGY; DATA PROCESSSING, ELECTRICAL SERVICE TECHNICIAN, MEDICAL RECORD TECHNOLOGY, SURVEYING AND WELDING, AS WELL AS OTHERS.

UNDER JTPA, WE PARTICIPATE WIDELY AS A COOPERATIVE PARTNER IN ON-THE-JOB TRAINING, AND IN CLASS-SIZE TRAINING FOR IDENTIFIED OCCUPATIONAL NEEDS. WE PARTICIPATE ON A COMPETITIVE BASIS WITH OTHER TRAINING PROVIDERS IN BASIC SKILL TRAINING FOR ADULTS, WHOSE INABILITY TO SPEAK, READ OR WRITE THE ENGLISH LANGUAGE, OR HANDLE MATHEMATICS, IMPAIRS INABILITY TO GET OR KEEP A JOB. FRANKLY, THESE ARE FREQUENTLY MORE PRESSING NEEDS THAN THE HIGH TECHNOLOGY SKILLS. WE ALSO PROVIDE PRE-EMPLOYMENT SKILLS TRAINING IN JOB READINESS AND JOB SEARCH ASSISTANCE IN DEVELOPING JOB SEEKING SKILLS. SO MANY OF THESE INDIVIDUALS IDENTIFY THEIR PERSONAL SENSE OF WORTH WITH THE JOBS THEY NO LONGER HAVE, THAT OUR INTENSIVE COUNSELING PROGRAMS ARE CRITICAL IN HELPING THEM TO MAINTAIN A SENSE OF WORTH AND DIGNITY. THESE

COMPREHENSIVE APPROACHES TO REBUILDING ATTITUDES AS WELL AS SKILLS ARE UNFORTUNATELY DIFFICULT TO STRUCTURE UNDER EXISTING REGULATIONS.

AS AN INSTITUTION, WE TRY TO BROKER THESE EXISTING FEDERAL PROGRAMS ALONG WITH STATE PROGRAMS, SUCH AS NEW YORK'S STRUCTURAL UNEMPLOYMENT RETRAINING PROGRAM, WHICH ALLOWS US TO TRAIN PEOPLE FOR IDENTIFIED OPENINGS IN A VARIETY OF LOCAL INDUSTRIES. THE PROGRAM MAKES IT POSSIBLE FOR US TO PICK UP ALL TRAINING COSTS, WHILE PROVIDING PEOPLE WITH THE NECESSARY TECHNICAL SKILLS TO TAKE THOSE JOBS. THROUGH WHAT IS CALLED A "CONTRACT COURSE PROGRAM" IN NEW YORK STATE, WE ARE ABLE TO TAILOR SPECIFIC INSTRUCTIONAL PROGRAMS FOR AREA BUSINESS AND INDUSTRY. WITH THE REMINGTON ARMS CORPORATION, FOR EXAMPLE, WE HAVE TRAINED CURRENTLY EMPLOYED MACHINISTS TO MOVE INTO COMPUTER NUMERICAL CONTROL MACHINING, IMPROVING COMPANY PRODUCTIVITY, AND PROTECTING EXISTING JOBS. WE HAVE ALSO TRAINED AREA EXECUTIVES AND MID-LEVEL MANAGERS IN VARIOUS ASPECTS OF EFFICIENT SUPERVISION, MANAGEMENT AND PRODUCTIVITY IMPROVEMENT.

WE WORK CLOSELY AND SUCCESSSFULLY WITH OUR LOCAL PRIVATE INDUSTRY COUNCIL, AND WITH A LOCAL LIAISON GROUP KNOWN AS THE INDUSTRY-LABOR-EDUCATION COUNCIL. OUR COLLEGE FOUNDATION SPONSORS A HIGHLY SUCCESSFUL GROUP FOR TOP MANAGEMENT, CALLED THE MOHAWK EXECUTIVE FORUM. ITS ACTIVITIES INCLUDE INDUSTRY-SPECIFIC ROUNDTABLES BETWEEN INDUSTRIAL MANAGERS AND COLLEGE OFFICIALS.

ADDITIONAL INCENTIVES FOR DEVELOPING WORKING RELATIONSHIPS WITH BUSINESS AND INDUSTRY, OR FOR DEVELOPING TOTALLY NEW CERTIFICATE AND DEGREE PROGRAMS, DO NOT SEEM TO BE A PRIORITY NEED OF OUR COMMUNITY COLLEGES.

WHAT IS NEEDED...AND I SUGGEST THAT THEY CAN BEST BE DEVELOPED BY MODIFYING EXISTING PROGRAMS RATHER THAN BY CREATING ANOTHER NEW PROGRAM...ARE TECHNICAL ASSISTANCE TO OUR COLLEGES TO INSURE THAT THE TECHNOLOGICAL PROGRAMS WE OFFER ARE STATE-OF-THE-ART, ASSISTANCE IN PURCHASING AND UPGRADING THE SOPHISTICATED AND EXPENSIVE EQUIPMENT NEEDED FOR TRAINING, AND INCENTIVES TO OUR INSTRUCTORS TO CONTINUE UPGRADING THEIR SKILLS, RATHER THAN BEING PLACED IN A LOWEST BID COMPETITIVE SITUATION AS SERVICE PROVIDERS, WE SHOULD BE ENCOURAGED FINANCIALLY TO MAKE OUR PROGRAMS AS STRONG AND COMPREHENSIVE, AS THEY CAN POSSIBLY BE. WHEN THAT HAS BEEN ACCOMPLISHED, WE SHOULD THEN BE USED EXTENSIVELY AND AGGRESSIVELY BY INDUSTRY AND GOVERNMENT TO PROVIDE MUCH-NEEDED WORKFORCE RETRAINING.

FOR US IN THE MOHAWK VALLEY, WHILE WE WILL CONTINUE WORKING TO CREATE NEW JOBS AND TO BRING IN NEW INDUSTRY, THE MAINTENANCE AND UPGRADING OF EXISTING JOBS MUST ASSUME AN EVEN HIGHER PRIORITY. AT THE SAME TIME, WE MUST REDUCE THE PARALYZING BURDEN OF PAPERWORK ASSOCIATED WITH EXISTING PROGRAMS. IT'S DUPLICATIVE, CONFUSING, AND INCREDIBLY TIME-CONSUMING.

WELL-MEANING LIMITATIONS ON ADMINISTRATIVE COSTS PREVENT US FROM CONDUCTING THE NECESSARY STAFF AND PROGRAM DEVELOPMENT DESCRIBED IN HR 2353. CURRENT PERFORMANCE STANDARDS ALSO IGNORE THE NEED AND POTENTIAL FOR KEEPING EXISTING JOBS, FOR RETRAINING AND UPGRADING SKILLS WITHIN OUR CURRENT INDUSTRIES IN ORDER TO HELP THEM REGAIN A COMPETITIVE POSITION IN NATIONAL AND INTERNATIONAL MARKETS.

FINALLY, ONE OF MY COLLEGE'S GREATEST PROBLEMS AS A SERVICE PROVIDER AND ONE OF THE GREATEST PROBLEMS FACED BY EMPLOYERS WISHING TO TAKE ADVANTAGE OF EXISTING JOB TRAINING PROGRAMS, IS PROGRAM DUPLICATION AND A SERIOUS LACK OF COORDINATION BETWEEN STATE, FEDERAL AND LOCAL PROGRAMS. WE WERE RECENTLY ABLE TO IDENTIFY TWENTY-ONE DIFFERENT OFFICES IN OUR SERVICE AREA WITH THE SPECIFIC RESPONSIBLITY OF BRINGING TOGETHER BUSINESS, INDUSTRY AND EDUCATION TO DEVELOP A JOB FORCE WITH BETTER TRAINING AND HIGHER LEVELS OF TECHNOLOGICAL SKILLS, IN ORDER TO FURTHER ECONOMIC DEVELOPMENT. WE DO NOT NEED TO OFFER A TWENTY-SECOND, BUT RATHER FULLY FUND, REFINE AND COORDINATE WHAT WE ALREADY HAVE.

lag
11-19-85

NATIONAL COUNCIL FOR OCCUPATIONAL EDUCATION
NCOE

THE NATIONAL COUNCIL for OCCUPATIONAL EDUCATION

AN AFFILIATE OF THE
AMERICAN ASSOCIATION OF
COMMUNITY AND JUNIOR COLLEGES

National Council for Occupational Education

The National Council for Occupational Education is a private, non-profit, professional organization affiliated with the American Association of Community and Junior Colleges. Through the efforts of its members, publications and various program activities, NCOE represents faculty members, department heads, deans, administrators, and members of business, industry, military, labor and government concerned with national issues, trends, and legislation relating to postsecondary occupational education. NCOE strives to promote interest and concern in occupational education and foster cooperation among educational and other organizations.

NCOE endeavors to:

- Unify all areas of occupational education
- Support legislation enhancing postsecondary occupational education
- Serve as an advisory council to AACJC on occupational education issues
- Facilitate communication and exchange of information on current and future trends in occupational education
- Develop national leadership through participation in Council activities
- Seek and implement regional or national studies and projects in occupational education
- Sponsor seminars and workshops throughout the country on postsecondary occupational education
- Provide forums at conventions of the AACJC

Through its newsletter, journal, monograph series, workshops, and program activities NCOE has, and continues to exercise, leadership in postsecondary occupational education on national and international levels.

Membership Categories

NCOE has now initiated an "institutional membership" category which allows an affiliating institution to designate up to three institutional representatives with each membership. NCOE continues to offer individual membership opportunities.

Membership Services

NCOE Newsletter, a quarterly publication which shares current information on exemplary occupational programs, institutional news, promotion of relevant workshops and conferences, and book reviews.

NCOE Monograph Series.

Research Dimensions, Inc. (RDI), a Washington based firm, is available to work with NCOE to identify and develop funding resources.

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- Associate in Applied Science Degree—policy development-dissemination
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- Support for the 1985 AACJC Public Policy Agenda
- Legislative Task Force

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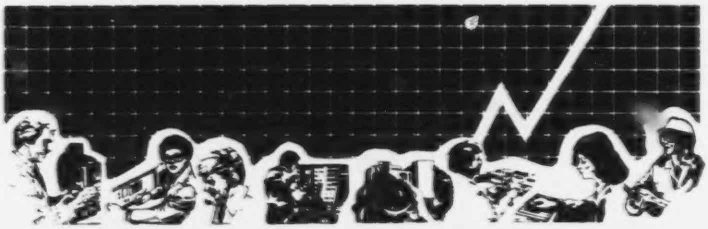

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Volume I

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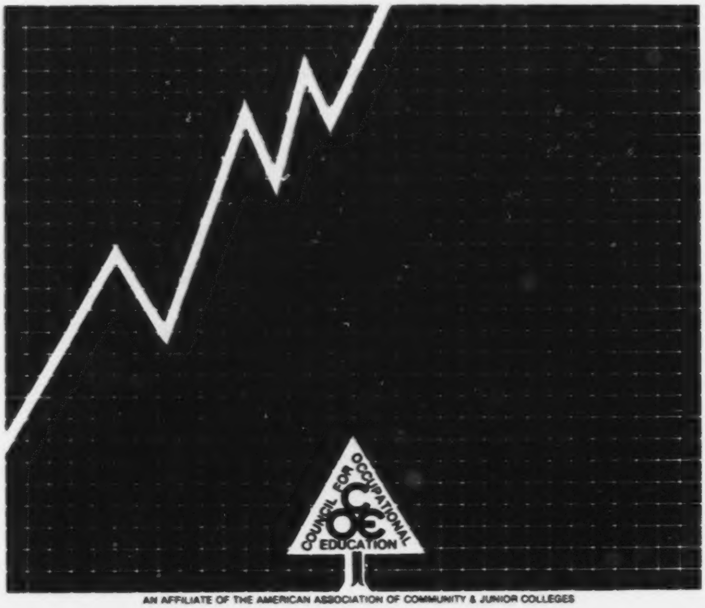
Number 1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Technician Supply and Demand:
How Can Community and Technical Colleges Help Fill the Need?

February, 1984

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Council for Occupational Education (COE)
Council for Community Services and Continuing Education (NCCSCE)
Association of Community College Trustees (ACCT)
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Overview

National data indicate that a widening gap in technician availability will occur during the remainder of the 1980's. The West and Southeast will have the greatest needs. In an effort to document how existing industry sees the current status of trained technicians, the AACJC Council for Occupational Educational (COE), the Association of Community College Trustees (ACCT) and the Electronic Industries Association (EIA) conducted a targeted national survey during 1983.

While the data may not be entirely firm, the American Society for Training and Development (ASTD) study by Carnevale and Goldstein was also reviewed. It indicates that non-school providers including the military currently provide the majority of the job-related education and training. Community and technical colleges are identified as a major untapped resource in training for the military services as well as for business and industry. In summary, the point is made that community and technical colleges should not leap, but move carefully and cautiously into the development of "high tech" programs.

The Technician Shortage

In its May, 1981 report, the American Electronics Association (AEA) projected needs across the board for technicians trained in the broad field of electronics. This report entitled "Technical Employment Projections of Professionals and Paraprofessionals: 1981-1983-1985" was cited in the AACJC concept paper entitled "Putting America Back to Work". In attempting to draw attention to programs to target for inclusion in any new national employment and training legislation, "Putting America Back to Work" noted several skill shortage areas outlined in the 1981 AEA projections.

In an effort to update its 1981 projections, the American Electronics Association surveyed 815 companies representing one-third of the electronics industry during 1983. This survey led to a report entitled "Technical Employment Projections, 1983-87." The results indicated that the electronics industry will need over 60 percent more technicians by 1987 than are employed in 1983. The industry indicates that more than 115,000 new technician jobs will open up by 1987 in addition to any needed replacements for workers lost due to attrition. It is important to note that these technicians need skills which are now provided by existing community and technical college programs. While the largest numerical growth will be in both the electronic assembly and electronic technician areas respectively, the largest percentage growth, though the smallest number, will be in the broad area of drafting.

While the "bread and butter" areas show the greatest numerical growth, significant growth is also shown in the high technology areas of robotics, computer assisted design (CAD), computer assisted manufacturing (CAM), and fiber optics. The exact number of new jobs is difficult to assess based upon the relatively small number of industrial respondents. While the percentage increases in these fields will range from 100 to 700 percent over the present employment force, the absolute number of new positions will be relatively small as a portion of total jobs. The report also cautioned that the area of high technology cannot be looked upon as providing the total answer to the country's employment needs. The report indicates that the high technology area should be looked upon as having a significant impact through the job multiplier effect in service and other areas through improved productivity. The rank order of geographic growth areas nationally is as follows: (1) West, (2) Southeast, (3) Northwest, (4) New England, (5) Southwest, (6) Midwest, (7) Mid Atlantic.

The results also point out that companies with 50 or fewer employees predict the larger percentage increase in additional future technician jobs as compared with companies employing 500 to 1,000 persons. Additional growth is also anticipated nationally in the professional areas of baccalaureate degree and higher engineers in the area of software engineering, computer analysts, and electronics engineering. The AEA report further goes on to state that approximately 16 percent of the technician increases are based upon anticipated defense contracts from the United States Government.

These results, while very significant, do not give the full picture. The military services will also need increased numbers of personnel to operate and maintain the increasingly complex weapons and related systems that are continually coming on line. Evidence of this need was presented by AACJC/ACCT witnesses in the December 1983 hearings in Iowa on the Skilled Enlisted Reserve Training Act (SERTA) H. R. 1937 and S.801 chaired by Senator Roger W. Jepsen, (R.-Iowa).

Technician Shortage Survey Results

In an effort to document the areas of strength of community and technical colleges indicated previously, the AACJC Council for Occupational Education (COE) along with the Association of Community College Trustees (ACCT) and the Electronic Industries Association (EIA) jointly sponsored a National Technician Supply and Demand Survey during 1983. The staff at 23 community and technical colleges surveyed business and industry in 20 metropolitan areas within 15 states. Of the 353 industries participating in the survey, 293 gave complete responses.

Rank Order of Businesses and Industries Responding by State

State	No. of Companies Surveyed	% of Respondents
Florida	45	15.4
North Carolina	29	9.9
Colorado	28	9.6
Massachusetts	26	8.9
Michigan	26	8.9
New Jersey	22	7.5
Illinois	22	7.5
Georgia	21	7.2
Texas	19	6.5
Arizona	16	5.5
California	14	4.8
New York	13	4.4
Ohio	8	2.7
Washington	3	1.0
Connecticut	1	0.3
TOTALS	293	100%

A profile of the companies surveyed indicated that 157 or 54 percent had affiliated subsidiaries while 105 or 36 percent were wholly owned companies. Ten percent of the firms surveyed did not classify themselves as either wholly owned or with affiliated subsidiaries. In terms of the type of business, 106 or 36 percent were engaged in manufacturing, 28 or 10 percent were engaged in research and development, 42 or 14 percent were engaged in both research and development and manufacturing, and 111 companies or 38 percent identified themselves as "other". Five companies or two percent did not respond. In the area of technician skill requirements, the companies surveyed identified 15 areas of skills or competencies which they require from an entry level technician. The items high on the list involve basic electronics, mathematical competence, communication skills, blueprint reading and knowledge of test equipment. The nation's community and technical colleges can profit from the rank order of skills and competencies as they compare their existing programs in the broad technician areas to ascertain the degree to which their current programs support these skills.

Rank Order of Basic Skills or Competencies Required from an Entry Level Technician

Skill	Number Mentioning	% of Respondents Mentioning Item
Basic Electronics	98	33.4
Mathematical Competence	71	24.2
Schematics/Blueprints	70	23.9
Test Equipment	56	19.1
Communications Skills	55	18.8
Work Experience	55	18.8
Circuits	43	14.7
Troubleshooting	43	14.7
Digital Electronics	32	10.9
Analog Systems	22	7.5
Wiring/Soldering/Welding	20	6.8
Manual Dexterity	20	6.8
Analytical Ability	18	6.1
Instrumentation	18	6.1
Measuring/Calibration	16	5.5

Business and industry gave community and technical colleges a pat on the back when it came to answering the question on how steps are being taken by business and industry to alleviate present technician shortages. While industry said that in-house training and recruitment efforts should be increased, they gave high marks to utilizing the existing training from the nation's community and technical colleges. Community and technical college training still ranked third, however, indicating that there is still room for improvement.

Rank Order of Steps to Alleviate Present Technician Shortages*

Method	**Number Mentioning**	**% of Respondents Mentioning Item**
Increase In-House Training	122	41.6
Increase Recruitment Efforts	87	29.7
Training From Community & Technical Colleges	79	26.9
Improved Benefits and Working Conditions	61	20.8
Increase Use of Part-time Employees	48	16.4
Increase Use of Overtime Work	48	16.4
Increase Wages Of Existing Staff	33	11.3
Increase Training at Private Technical Schools	25	8.5
Other	28	9.6
No Present Shortages	146	50.1

*Percent of respondents exceed 100% as many companies mentioned more than one item.

In keeping with the American Electronics Association Survey, the business and industries surveyed indicated that company expansion and industry-wide growth and demand for technicians were the leading perceived causes for present technician shortages in their company. Quality of outside training was an issue, as was insufficient output from community colleges.

Rank Order of Perceived Causes for Present Technician Shortages

Cause	**Number Mentioning**	**% of Respondents Mentioning Item**
Company Expansion	62	21.2
Growth in Demand (industry-wide)	58	19.8
Poor Training Received	36	12.3
Insufficient Comm. Coll. Output	28	9.6
Decline in New Entrants	20	6.8
Geographical Location (of firm)	16	5.5
Other	86	29.4

The basic technician types were reported in the survey to be the most common technician categories hired in the last twelve months. The rank order of the eleven top technician types are listed below. What is probably more significant is what is not on this list: the "high technology" technician areas. The survey indicated that 9 technician categories generally regarded as "high technology" areas represented less than 10 percent each of the technicians hired in the last twelve months. As in the American Electronics Study, these areas are relatively fast growing in percentages but also relatively smaller in number to the total number of all technicians that will be needed in the next five years.

Most Common Technician Types Hired in the Last 12 months

Technician Type	Number Mentioning	% Mentioning Item
Electronics Engineering	143	48.8
Electrical Engineering	98	33.4
Computer Programmer	89	30.4
Electromechanical	79	27.0
Manufacturing Engineering	60	20.5
Chemical Technician	57	19.5
Mechanical Drafting	54	18.4
Instrumentation	48	16.4
CAD/CAM	45	15.4
Industrial Engineering	41	14.0
Mechanical Engineering	40	13.7

"High Technology" Technician Areas Mentioned by less than 10% of Respondents

Biomedical Technician
Energy Management Technician
Environmental Science Technician
Fiber Optics Technician
Genetic Engineering Technician
Industrial Ceramics Technician
Nuclear Technician
Occupational Safety and Health Technician
Robotics Technician

The average number of employees per firm surveyed was about 1,400, while the average number of professional engineers was 117 or about 8 percent of the companies' total workforce. The average number of technicians per firm was 116, or also about 8 percent of the workforce. While over 60 percent of the responding firms indicated that the survey question on "number of technicians to support one engineer" was not applicable, national statistics developed by Vetter and the Scientific Manpower Commission indicate the national average on the number of technicians to support one engineer is on the order of three to five technicians to one engineer.

In the area of minimum educational requirements for entry level technicians, community and technical colleges received their greatest support. Thirty-seven percent of the industries surveyed indicated that the associate degree was the minimum educational requirement for entry level technicians in their firm. While 26 percent of the industries gave more than one category, the 37 percent response for the associate degree is contrasted with 11 percent and 10 percent respectively for the bachelor's degree and the high school diploma. The recognition of the associate degree by business and industry gives much support for AACJC/ACCT legislative initiatives in Congress to utilize community and technical colleges in "putting America back to work" and in helping to meet the technician needs of the military.

Minimum Educational Requirements for Entry-Level Technicians

Level	% Responding
Associate Degree	37.0
Bachelor's Degree	11.0
High School Diploma	9.9
Other	7.0
Industry In-house Training	4.7
Equivalent Military Training	4.2
More than one level given	26.2

Industry provides about one-third of the nation's job-related education and training according to a recent study by Carnevale and Goldstein. The survey respondents, however, do not regard in-house training as a sufficient minimum level for hiring entry level technicians.

Of the industries surveyed, 57 percent estimated the labor supply for technicians generally to be adequate. A relatively high 32 percent of the industries indicated that technicians were in scarce supply, while 11 percent said the supply was plentiful.

This support for the associate degree also comes at a time when an American Association of Community and Junior Colleges National Task Force to Redefine the Associate Degree found that the associate degree is "alive and well". The Task Force surveyed business and industry as well and found that many of the skills and competencies identified in the present Technician Supply and Demand Survey were also given a very high priority. Increased or higher standards and establishment of minimum competencies for all students seeking a degree were also strong recommendations of the Task Force. The Task Force further recommended the establishment of an associate in high technology degree that could be designed with the help of business and industry and such a degree could incorporate both liberal learning and technical education as an integral part.

Who Does The Training Now?

In an effort to show who does the training in our country, Carnevale and Goldstein recently completed a report for the American Society for Training and Development (ASTD) entitled "Employee Training: Its Changing Role and An Analysis of New Data." Amercian business and industry spend nearly $30 billion a year on the education and training of 11 million employees. The bulk of the data in this report came from the U.S. Census Bureau's survey of adult education. Carnevale and Goldstein indicate that of the training taking place outside business and industry, 63.5 percent took place at colleges and schools. This breaks down into 35 percent for four-year colleges, 19 percent for two-year colleges and 7 percent for vocational, trade and business schools.

Carnevale and Goldstein indicate there is no category of course that employers feel unable to provide among the 14 different categories of courses surveyed. Of all of the courses offered by business and industry, nearly 40 percent of the in-house courses were in business and nearly 20 percent were in the area of engineering.

School and Nonschool Providers For Job-Related Education and Training*

Provider of Instruction	Percent
•Schools:	
Elementary and secondary	0.4
Two-year colleges	6.4
Four-year colleges and universities	16.3
Vocational schools	9.5
Proprietary schools	9.0
Correspondence schools (civilian)	2.9
Sub Total	44.6
• Non School Providers:	
Business firms	33.9
Professional associations	2.7
Labor unions	0.1
Armed forces:	
Training (except basic training)	3.0
Correspondence	2.7
Prisons	0.5
Other government programs:	
Manpower training	7.7
Cooperative extension	1.2
Employee training and other	2.0
Community-based programs	1.3
Tutors	0.2
Sub Total	55.3
TOTAL	100.0

*Source: Carnevale and Goldstein, "Employee Training: Its Changing Role and An Analysis of New Data." This chart shows where money for job-related training is spent, eliminating the overlap between training paid for by employers but conducted at other institutions, such as schools. Figures for nonschool providers, therefore, reflect only in-house training.

According to the Carnevale and Goldstein report, nonschool providers, including the military, currently provide a majority of the job-related education and training. While they have tremendous capabilities, community and technical colleges still remain a largely untapped resource in the area of education and training. The school and nonschool provider data above must be questioned, however, since two-year colleges surely provide more than 6.4 percent. This rather low figure for two-year colleges must be based on a narrow definition of "job-related education and training", and, in addition, much of the "manpower" training is done through two-year colleges.

Role of Community and Technical Colleges

In "Putting America Back to Work" the AACJC Task Force members identified a number of areas where community and technical colleges were well positioned to fill these skills needs. They indicated that the nation's over 1,200 community, technical and junior colleges can (1) prepare technicians and skilled workers for specific occupations, including defense-related occupations, and (2) provide literacy training, upward mobility, and retraining opportunities for employees particularly aimed at skilled worker shortages, and (3) participate in statewide economic development and reindustrialization strategies.

The AACJC/ACCT legislative program for 1983, and carried forward into 1984, indicates the capabilities of community and technical colleges to meet the needs of business and industry for trained technicians. In addition, community and technical colleges can augment specific technician needs identified by the military services.

In addition to the above, many community and technical colleges are directly involved with the Job Training Partnership Act (JTPA) programs at the local level, and many dislocated workers will be retrained for new careers. If the Vocational Education Act (VEA) is refocused as proposed by AACJC and AVA, new initiatives for economic development and adult retraining will go far toward meeting industries' needs.

Summary

While the industries responding to this survey were from the broad field of electronics, electronics today serves as the cornerstone of our shift from what Naisbett calls the transition from manufacturing to an information society.

The various local studies and surveys that are ongoing involving business, industry and community and technical colleges will definitely provide results which will be used to further support and undergird the community college mission nationally. These results can only serve to inform Congress, the military, and business and industry of the role that community and technical colleges can play and are playing in the training of technicians to meet the needs of our nation's growing and increasingly productive workforce.

Among conclusions that can be drawn from this study are the following:

- While the percentage increase in the technician categories cited are high, the absolute numbers of new positions is modest in these industries in relation to total jobs projected.
- The findings support the thoughts by Owen that strong general education components are crucial to meeting the needs of today's technology.
- Community and technical colleges can help fill projected technician demands by careful assessment of local industry needs along with strengthening the quality and competencies of the graduate to meet industry needs as set out in the survey responses.
- Community and technical colleges should not leap, but move carefully and cautiously into the development of "high tech" programs.

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Electronics Industries Association

December 21, 1982

Your area has been identified as one of 20 geographical areas in the country to participate in a sample survey of technician supply and demand. Thirty-one community and technical colleges have been invited to participate in this national effort. A list of the geographical areas involved and colleges participating is attached to this letter along with 30 copies of the survey instrument. The effort is being conducted under the joint auspices of EIA, AACJC and ACCT.

It is our request that you survey a minimum of 25 companies in your service area. The companies selected should be a mix of types of industries as well as be from large to medium in size, and should employ the types of technicians listed on page two of the survey instrument.

These survey results will be used to further support and undergird the community college mission nationally. The survey results, while kept in a confidential manner, will be aggregated for the purpose of informing business, industry and the military of the role community colleges can play in technician training. This should enhance an already growing community college-industry linkage nationally with the results being used to carry our message to Congress and the business community at large.

We would be most appreciative if you would return a minimum of 25 completed survey instruments to the address below by February 1, 1983. Please return your individual surveys as a group to the following address:

Dr. H. James Owen, Vice President for Program Services
North Carolina Department of Community Colleges
114 W. Edenton Street, Raleigh, NC 27611

Thank you very much for your assistance in this most important national survey. If you have any further questions, please do not hesitate to contact Dr. Owen at the phone number below.

Sincerely,

H. James Owen
Member, Board of Directors
AACJC Councils for Occupational
Education and Community Services
and Continuing Education
(919) 733-3345

Thomas B. Patton, Director
Human Resources Council
Electronic Industries Association
Washington, D.C. 20006
(202) 457-4925

2001 Eye Street, N.W. • Washington, D.C. 20006 • (202) 457-4900 • TWX: 710-822-0148

December, 1982

LOCAL AREA TECHNICIAN SUPPLY AND DEMAND SURVEY

Electronic Industries Association (EIA); Association of Community College Trustees (AACT)
American Association of Community and Junior Colleges (AACJC)

Dear Sir:

Your local Community of Technical College is involved as part of a nationwide survey of technician supply and demand. Your answers to this brief survey will be kept confidential and the results will be used only for aggregate statistical purposes. Thank you.

1. General Information
   Location-City ________ State ________ Name of person completing form ________
   Phone Number (Area Code) (Number) ________________
   Please check those items that apply
   a. Company with one or more subsidiaries____ b. Wholly owned firm with no subsidiaries____
   c. Describe type of business or industry engaged in by company (check one)
   ____Research and Development ____Manufacturing ____Other (give type here) ________
   d. Total Number of Employees _____ e. Total Number of Engineers Employed_____
   f. Total Number of Technicians Employed _____

2. Please list five basic skills or competencies you expect from an entry level technician regardless of job title.
   a. ________________ c. ________________ e. ________________
   b. ________________ d. ________________

3. Please list any job titles other than technicians, in your company which routinely perform tasks requiring competencies and skills similar to or equal to a technician.
   ________________ ________________
   ________________ ________________
   ________________ ________________

4. What steps are you taking to alleviate shortages in those technician areas where they exist? (Please circle all that apply)
   a. improved benefits and working conditions for existing employees
   b. increased recruitment efforts
   c. obtaining training from nearby community or technical colleges
   d. paying higher wages than similar industries in the area
   e. increased in-house training
   f. use private technical schools like Devry Institute of Technology
   g. hiring temporary or part-time employees
   h. increased use of overtime work
   i. no present shortages
   j. other (write-in) ________________________________

5. What are the causes of technician shortages in your company? (Please circle one or more and rank in priority order by putting a number beside each letter.)
   a. inappropriate training in your local area community or technical college
   b. rapid company expansion
   c. industry-wide requirements growing faster than supply
   d. insufficient output from your local area community or tech. college
   e. company located in undesirable geographic location and thus inherently difficult to recruit technicians
   f. decline in supply of new entrants
   g. other (write-in) ________________
   ____

	Architectural Technician	Biomedical Technician	CAD/CAM Technician	Chemical Technician	Civil Engineering Technician	Commercial Graphic Technician	Computer Programmer Technician	Electrical Engineering Technician	Electromechanical Technician	Electronics Engineering Technician	Energy Management Technician	Environmental Science Technician	Fiber Optics Technician	Genetic Engineering Technician	Industrial Ceramics Technician	Industrial Engineering Technician	Instrumentation Technician	Manufacturing Engineering Technician	Marine Technician	Mechanical Drafting & Design Technician	Mechanical Engineering Technician	Nuclear Technician	Occupational Safety & Health Technician	Robotics Technician	Other	Other	
6 What is your company's minimum education requirement for entry into each of the listed areas?																											
a Associate Degree																											
b Bachelors Degree																											
c equivalent military training																											
d industry in-house training certificate																											
e high school																											
f other (write in)																											
7 Number of technicians employed (Fill the number in under each column)																											
8 Number of technicians usually employed to support one engineer or scientist (Fill the number in under each column)																											
9 Number of technicians hired in the last 12 months (Fill the number in under each column) Total hired in last 12 months																											
total number for replacements																											
total number for new positions																											
10 Estimate of labor supply (Place a check on the appropriate line under each column)																											
scarce																											
adequate																											
plentiful																											
11 Sources of technician supply (Fill the number in under each column)																											
up-grading of present employees																											
adequate																											
outside hiring																											

Council for Occupational Education

Volume II

Monograph Series

Number 1

NATIONAL COUNCIL FOR OCCUPATIONAL EDUCATION

AN AFFILIATE OF THE AMERICAN ASSOCIATION OF COMMUNITY & JUNIOR COLLEGES

Criteria for Excellence in Associate in Applied Science Degree Programs

A Policy Statement
of the
National Council for Occupational Education
prepared by the
Task Force on the Associate in Applied Science Degree

July 15, 1985

Additional copies may be purchased at a cost of $3.00 each from:
Dr. Russell Paulsen, NCOE Executive Director, 1000 Campus Drive, Wausau, WI 54501.

Introduction

The quality of American education is a prime issue of national concern in this decade. The gulf between societal expectation and realization was first identified in the elementary and secondary schools with the label of mediocrity being liberally applied. Soon after, higher education also came under scrutiny. By the early 1980's, the American Association of Community and Junior Colleges (AACJC) had already begun a study of the Associate Degree which serves as the curriculum base for the 1,200 community, technical and junior colleges in the nation. The conclusions and recommendations of this study provided basic guidelines for the associate degree which were accepted as an official policy statement by the Board of Directors of AACJC in July of 1984.

The dialogue within the two-year college community generated by this statement has sparked a closer look at a specific type of associate degree - the Associate in Applied Science (AAS). This most recent and perhaps most promising variant is designed primarily to prepare students for immediate employment in a career field without foregoing the opportunity for further education. The AACJC Policy Statement included the following reference to the Associate in Applied Science Degree:

> The second type of degree program is designed to lead the individual directly to employment in a specific career. While the titles given these degrees vary considerably among community, technical, and junior colleges, the most common title is Associate in Applied Science. Other titles used are Associate in Business, Associate in Data Processing, or other specific occupations, and Associate in Applied Arts and Sciences. It should be noted that the number of degrees awarded in these occupational areas has been increasing in the last two decades. In some instances, particularly in the health-related fields, the degree is a prerequisite for taking a licensing examination. Some institutions belong to voluntary specialized accrediting agencies that set qualitative degree standards for their programs. Although the objective of the Associate in Applied Science degree is to enhance employment opportunities, some baccalaureate degree granting institutions have developed upper division programs to recognize this degree for transfer of credits. This trend is applauded and encouraged.

Postsecondary occupational education, including AAS degree programs, increased dramatically between 1960 and 1970. According to the National Center for Educational Statistics, 43% of all associate degrees awarded in this decade were occupational in nature. By 1980, according to the preliminary presentation of the AACJC National Task Force to Redefine the Associate Degree, this figure had risen to 62.5%. The AAS degree, or similar occupational degrees, had become the choice of the majority of community, technical, and junior college graduates.

Statement of Purpose

In response to this trend, the National Council for Occupational Education (NCOE), an affiliate of AACJC, saw an urgent need to identify criteria leading toward excellence in the AAS degree so that it may become the cornerstone for a national program of human resource development. It will then become more effective for a wide range of occupational education and as a national employment credential.

In the interest of brevity, as well as avoiding areas already dealt with in other recent reports of undergraduate education, this report is primarily concerned with the curriculum for the AAS degree. It concentrates on the scope, form, substance, and image of the degree - all in a national context.

As in the preceding work of the AACJC National Task Force to Redefine the Associate Degree, the overall objective of this report is to clarify the function of this specific associate degree and to recommend ways of strengthening it. In a word, to propose, with ample feedback from the field, criteria for excellence in AAS degree programs.

Criteria for Excellence in AAS Degree Programs

1. **Associate degree programs designed primarily for immediate employment should be designated as an Associate in Applied Science Degree Program.**

Degree Designation

Considerable variation in associate degree titles exists across the nation, particularly in occupational education. Although some states use the Associate in Science (AS) degree to designate two-year occupational programs, by far the more common usage is the AAS. Common degree terminology should improve national visibility, reduce confusion in our mobile economic society, increase the credibility of the AAS degree, and form the basis for a nationwide program of human resource development.

2. **The AAS degree should be identified with a specialty designation.**

Specialty Designation

This identification of a specialty or major, currently common practice in many institutions, implies relevant preparation for employment in a specific area of work. Even though there are advantages in labeling the degree program as specifically as possible, this should not preclude designations that cover a field of study rather than a single specialty, e.g., Associate in Applied Science Degree in Health Occupations.

3. **AAS degree programs must be responsive to the employment needs of business, industry, public agencies, the military, and entrepreneurship.**

Employment Needs

The single most important purpose of the AAS Degree is to prepare students to enter directly into specific occupations. For the degree to achieve greater acceptance as an employment credential, effective articulation must be developed between the educational institution and the employers of AAS degree graduates. The most important facet of the linkage with employers is the maintenance of a timely and effective curriculum reflecting current practices in the work world. This relationship with employers, however, breaks with academic tradition in that AAS degree curricula are not initiated and developed solely within the educational institution. This partnership between the institutions and the potential employer needs to be nurtured continuously.

4. **All components of the AAS degree requirements should become outcome oriented.**

Outcome Orientation

Common practice in higher education is to define course and program requirements in terms of subject matter topics. Instead, faculty and academic officers from all components of the program should develop and disseminate a statement of the course and program outcomes that students must achieve. While not all of the course and program outcomes can easily be measured, there remains a responsibility to define the knowledge, skills and attitudes students are expected to attain. It is expected that this outcome orientation will apply to all components of the degree, including general education, related studies and technical specialty courses. Evaluation measures and procedures should be routinely utilized to assess the adequacy of each course in meeting stated outcomes. Special attention should be given to measuring the success of graduates on the job.

5. The AAS degree requirements should be limited to 60 to 72 semester credit hours or 90 to 108 quarter credit hours.

Total Credit Hours

There is a growing tendency to expand credit hour requirements for occupational programs to meet a variety of pressures including those from specialized accreditation and licensure agencies. Semester credit hours beyond 60 (90 quarter hours) lengthen and intensify the program beyond the normal academic load. Fifteen credit hours per term is a reasonable and challenging load for full-time students. Requirements beyond 60 semester hours (90 quarter hours) should be fully justified in terms of program outcomes. Remedial and developmental work should be in addition to the collegiate level requirements of the degree program but should, whenever possible, be pursued concurrently with skill training to enhance intent and relevance.

6. The technical specialty component of the AAS degree should constitute 50% to 75% of the course credits.

Technical Specialty

Although general education is increasingly more important in an informational society, the credibility of occupational programs rests with the ability of the AAS degree graduate to function at the technical and mid-management level. The technical specialty component should emphasize an applications orientation through laboratory, clinical and work experiences sufficient to qualify for entry-level employment.

7. The general education component of AAS degree programs should constitute a minimum of 25% of the course credits with the combination of general education and related studies constituting up to 50% of the course credits.

General Education and Related Studies

There is an increased recognition of the importance of general education and related studies as integral components of occupational education. Increasingly, the ability to think, reason, compute, communicate and adapt to change are essential if workers at all levels are to remain employable and cope with the expanding knowledge base. General education also includes human development in civic, consumer, environmental, and social responsibilities. Related studies typically achieve a dual purpose of enhancing general human development and providing a basic foundation for the pursuit of more advanced occupational goals. General education and related studies outcomes should be identified, implemented and measured by the institution.

8. Although open admission to the institution for all adults is a cardinal characteristic of most community, technical, and junior colleges, minimum criteria for admission to AAS degree programs are essential.

Admission Requirements

Admission requirements should be established on an individual program basis to assure that the entering student has a reasonable probability for success and that course and program standards are maintained. Where appropriate, pre-assessment should be included in the admission requirements. Such requirements must be accompanied by maximum opportunities for access to programs by students who do not initially meet the requirements. Developmental or pre-technical certificate programs, tutoring, and/or special laboratory assistance are examples of how this may be accomplished.

9. AAS degree programs should be supported by student services designed systematically for the needs of career-oriented students.

Student Services

As a result of the vigorous growth of occupational programs, student services now play a much larger and more important, even critical, role in student success than previously. Some colleges have even expanded the definition of "student" to include the entire community of the adult work force and now offer services to the currently employed and the unemployed. Occupational education has thus expanded horizons and markets of two-year institutions immeasurably but must now provide for success and promotability as well as entry into employment. Continuous interaction with students should begin with pre-admission testing, assessment, and counseling to assure a reasonable match of student aspirations and skills with programmatic requirements and expectations. These services should include career development activities which lead to successful placement and/or transfer.

10. A curriculum structure with multiple exit/re-entry points should be considered for the AAS degree whenever possible.

Multiple Exit/Re-Entry

A multiple exit/re-entry structure for the AAS degree has distinct advantages for many students who because of work, family or other obligations do not complete the AAS degree in a continuous mode. Such students necessarily take advantage of convenient "stop-outs" where they can complete a segment of the program with some degree of closure before going further. One such common "building block" approach is a series of certificates which represent flexible components of the AAS degree program that may eventually be converted into the full degree. In this sense, the degree becomes a credential increasingly representative of technical and mid-management level employment; a natural step up from certificates generally identified with entry-level employment plateaus. The technical specialty component of the AAS degree should be provided as early in the program as possible. Exit/re-entry points at the end of the first term and/or first year of the program should be given particular consideration.

11. Credit toward the AAS degree should be awarded for knowledge and skills acquired through prior experiences.

Experience Based Credit

Increasingly, the concept that learning is learning, regardless of the source, is gaining acceptance. The ultimate determinant of what is creditable must, however, reside in college policy determined with substantial faculty involvement. Currently, credit is being awarded by many colleges for prior knowledge and skills acquired from many sources including proprietary schools, the military, labor unions, community based organizations, in-service programs of business and industry, work experience, independent study, and examinations. Care must be exercised to assure that the integrity of program outcomes is maintained when such experiences are assessed.

12. AAS degree curricula should be articulated with appropriate general and vocational secondary schools.

Secondary School Articulation

There is a trend toward increased articulation between secondary and postsecondary institutions. The advantages of such articulation are to encourage earlier goal orientation, provide possible advanced placement and avoid unnecessary duplication. The growing use of outcomes as a basis for instruction and learning should make program comparisons much easier than the previous use of course titles and catalog descriptions.

13. AAS degree curricula should be articulated with receptive and appropriate four-year institutions through the cooperative planning and implementation of transfer agreements including two + two curricula.

Baccalaureate Articulation

Although AAS degree programs are designed primarily to prepare students for employment, they can no longer be considered terminal. In addition to the necessity for lifelong learning in response to the knowledge explosion, students can expect to make several career changes during their lifetime. Further education, including work toward a baccalaureate degree, should be anticipated for AAS degree graduates. Therefore, articulation agreements should be initiated by two-year institutions in those programs with the greatest potential for transfer. However, the occupational outcomes of AAS degree programs should not be subverted to the transfer potential.

14. Selected AAS degree programs should be networked among two-year institutions at the local, state and national levels.

Institutional Networking

There is increasing interest in developing consistency and comparability among similar occupational programs on state and national levels. As the AAS degree becomes universally accepted as an employment credential, it will be feasible to develop selected programs with comparable outcomes across the nation without sacrificing local flexibility. Institutions developing or revising AAS degree programs should consider comparability and consistency with similar occupational programs. Further networking is encouraged and should be facilitated by educational institutions, state agencies, and other regional and national organizations.

Summary

The criteria for excellence are essential for the AAS degree to achieve its potential both as a national employment credential and the curricular foundation for the occupational mission of community, technical, and junior colleges. In highlighted form, these criteria would help to assure that AAS degree programs are:

1. Clear and consistent in titles, length, components and outcomes - publicized and documented for all to see and know.
2. Articulated continuously with employers, four-year colleges, secondary schools, and the non-collegiate sector including specialized accreditation, credentialing, certification, and licensing agencies.
3. Flexible in structure for our varied adult clientele, with multiple exit/re-entry points which optionally may be compounded to attain the goal of technical and/or mid-management level employment equated with the AAS degree.
4. Open to students on a selective basis with full opportunity to remedy deficiencies in meeting admission requirements.
5. Supported by student services fitted to the occupationally oriented needs of AAS degree students.
6. Part of an expansive and universal definition and categorization of occupational education that conveys a positive image.
7. Part of a national network serving the comparable educational and training needs of the nation, states and communities.

Implicit in these criteria for excellence in the AAS degree is the assumption that community, technical, and junior colleges have taken on preparation for employment as a major function of their emerging identity. That identity will be strengthened by developing criteria for excellence in the AAS degree, the curricular cornerstone of community college occupationally oriented training and education. Concurrent with enhanced identity may come national acceptance of the 1,200 community, technical, and junior colleges as the preferred delivery system for a national program of human resource development embracing job and career-oriented training, education, and services for the entire adult community—pre-employed, employed, and unemployed. Such a goal is humanitarian. It is also central to the national self-interest to insure an educated and trained work force prepared for present and future manpower needs which, in turn, helps maintain a strong competitive position for our nation in the world economy. The AAS degree provides the curriculum base from which such a national program can be developed.

Illustration

AAS Degree Occupational Curriculum Guide
Generalized Example in Credit Hours

It should be emphasized that the illustration shown is an example only and should not be interpreted as a requirement or as an ideal. Many variations are possible and differences will likely be based upon the specific needs of a particular occupational field. In particular, the distinction between General Education and Related Studies is not always obvious. Likewise, the listing of traditional disciplines is not intended to detract from the required occupational outcome orientation or possible interdisciplinary approaches that might be used to achieve these outcomes. They are intended to better communicate the general scope, form and substance of the AAS degree criteria. The Technical Specialty Component would consist of those curriculum areas and outcomes, including supporting skills, that directly and immediately pertain to the specific occupational major.

	Semester Hours	Quarter Hours	Percent
1. TECHNICAL SPECIALTY COMPONENT	30-36	45-54	50%
2. GENERAL EDUCATION & RELATED STUDIES COMPONENT			
General Education			
Communications	6	9	
Behavioral or Social Sciences	6	9	
Humanities	3-6	4.5-9	
	15-18	22.5-27	25%
Related Studies			
Mathematics	6	9	
Business, Engineering, Science or Technology	6	9	
Computer Literacy	3-6	4.5-9	
	15-18	22.5-27	25%
Sub-Total	30-36	45-54	50%
TOTAL	60-72	90-108	100%

The Process

The Task Force on the Associate in Applied Science Degree was appointed by the Board of Directors of the National Council for Occupational Education in July of 1984. Based upon data collected by the American Association of Community and Junior Colleges in their 1983 study of the Associate Degree, the Task Force began a dialogue on Criteria for Excellence in Associate Degree Programs at the annual NCOE conference in October of 1984. In addition, individual members of the Task Force began discussions on the criteria with various organizations and agencies in their regions. Utilizing this input, an Interim Report was drafted by the Task Force and circulated to the 1200 member colleges of the AACJC and to each member of NCOE in January of 1985 with a call for comments and suggestions.

Responses from over one hundred individuals in sixty-four community, technical, and junior colleges were incorporated into the Revised Interim Report published for a workshop on Criteria for Excellence in AAS Degree Programs at the Annual Convention of the AACJC in San Diego, California on April 15, 1985. Reactions to and suggestions for the criteria were presented by a panel consisting of Dr. John Grede, Vice-Chancellor Emeritus, City Colleges of Chicago; Dr. Dale Parnell, President, AACJC; Dr. Henry Spille, Director, American Council on Education, Office of Educational Credits and Credentials; Dr. Robert Childers, Executive Director, Southern Association of Schools and Colleges; and Dr. Howard Bowen, Professor, Claremont Graduate School and member NIE Panel on Conditions of Excellence in Undergraduate Education. Workshop participants from throughout the nation then reacted to the proposed criteria and the comments of the panelists.

The comments and reactions obtained from this year-long process were utilized by the Task Force in preparing this policy statement, adopted by the Board of Directors of the National Council for Occupational Education in July of 1985. It is, however, recognized by the Task Force and NCOE that these recommendations will require revision and expansion to keep pace with changes in the work place and in our colleges - consequently, it is viewed as a "living document" that will be reviewed regularly. Comments continue to be welcome.

Task Force Members

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Quinsigamond Community College
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Terry J. Puckett (Co-Chairman), Vice President
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Thank you very much, Dr. Schafer. And then we will turn to Dr. Korim.

Mr. KORIM. Chairman Walgren and members of the committee: We are extremely pleased to have this opportunity to give testimony today.

As this committee conducts its business, nothing could be more important than to focus on national human resource requirements essential to the success of scientific and technological initiatives of our industry, Government, and private—and education sectors. In this regard, we at the Community College of Allegheny County believe that H.R. 2353, the National Advanced Technician Training Act, is a badly needed vehicle to address the present and future technical personnel requirements of the high-technology area—era.

As one official of a major firm providing instrumentation needed to retool and automate the traditional industries of Pittsburgh said recently:

> We have a great new line of sophisticated high-technology products and devices that we are selling to companies interested in reducing production costs, but the customers do not have the qualified people needed to use the new systems that we sell to them. So we spend a lot of time training their workers and many of them require more training than we can give them. We would rather have someone else like the Community College of Allegheny County do the training.

As the Community College of Allegheny County serves the education and training needs of the residents and the economy of the county of Allegheny and the city of Pittsburgh, we are faced with great contrasts. Allegheny County is basically a dual economy reflecting the degree of prior participation of the residents of the various communities in education and training. To a great extent, the well-being and the prosperity of the communities of Allegheny County increasingly relate to the level of education and training of the workers residing in those communities. Whereas in the not too distant past, the level of education and training had little to do with earning power essential to—in industries such as steel, today a family's purchasing power seems to be directly related to the level of education and training of the family heads.

One part of Allegheny County is thriving and another part of the county is faced with high unemployment. That part of Allegheny County that is known as the Monongahela Valley consisting of communities such as Homestead, Braddock, Duquesne, McKeesport, and Elizabeth is in the midst of a depression as serious as the Great Depression of the 1930's.

In these communities, a number of steel mills and ancillary firms have shutdown or have had major work force reductions, and therefore, unemployment is high, family income has dropped, consumer businesses are faced with declining sales, property owners are experiencing a decline in real estate values, and local municipalities are losing tax revenues due to the decline of the real estate market—market.

The bulk of the workers dislocated by steel mill closings possess skills that to a great extent are unique to the steel industry, but with proper assessment and proper retraining these workers can be prepared for new occupations in new industries.

These dislocated workers represent a rich human resource characterized by a strong work ethic, but this—their transition to new jobs in new fields has been hampered by the fact that many of them are suffering from a serious literacy deficiency particularly in learning skills in computation, communications, and science and from a form of technological backwardness that comes from employment in one mill and in one job for most of their working years. Consequently, each worker for the most part not only needs training and retraining for a new job, but that training requires that the worker have the readiness and willingness to learn the skills and competencies of a different job in a different industry. Many of the dislocated workers face an enormous transition giving—given the high technology skill requirements of labor market demand today.

This condition is not unique to Pittsburgh and Allegheny County, but faces many areas of the Nation undergoing structural changes in their respective economies. Obviously, H.R. 2353 can be of great assistance in addressing these retraining or cross training needs of dislocated workers.

The other part of the dual economy of Allegheny County is experiencing economic recovery. Much of this recovery is stimulated by the infusion of high technology into the economy. This part of the economy is largely characterized by research, development, and manufacturing activities that relate to advanced technology applications in medicine, industrial production, banking, and transportation. New entrepreneurial ventures have emerged from this focus on research, development, and production of high technology hardware and software.

In fact, Pittsburgh is increasingly becoming known as a national high-technology research and development center. This part of the economy to a great extent is characterized by a work force with professional preparation in the sciences and the new technologies and by regular participation in education and training related to technological advances.

In a recent survey of high-technology companies in the Pittsburgh area by the Pittsburgh High Technology Council, employment growth in the high technology industry between 1983 and 1984 was 34 percent and between 1984 and 1985 the projected growth in high technology employment is estimated at 18.5 percent, which translates to 40,000 individuals or about 20 percent of the area's work force.

My statement gives you a structural breakdown of the high technology industry in the Pittsburgh area and you can see from this statement that there is considerable diversity in the way the high-technology industry is made up.

Of the firms making up the high technology industry in the Pittsburgh area, more than half were found to be manufacturing firms and about 30 percent were in research and development or service businesses. Of the 263 high technology companies in the Pittsburgh area, nearly half of them were founded in the last 5 years.

Clearly, the configuration of the economy of the Pittsburgh area is changing extensively, as is the case throughout much of the Nation. And as we can see in the findings of the Pittsburgh High

Technology Council, a large share of the high technology industry is presently made up of firms involved in generating artificial intelligence and the application of this artificial intelligence to industrial processes and factory automation.

Indeed, we have entered a new economic era, an era which requires human beings to be able to interact with machines that have a programmed intelligence quotient. Machines that can be programmed with an IQ enabling them to make judgments about quality and make decisions on the adjustments that must be made in the production process to improve quality is quite a new phenomenon.

If machines can be programmed to have IQ's, then the demand for workers in the near future will obviously take a totally new configuration than that which has been the case in the recent past. This does not mean that there will not be a demand for a human work force. This simply means that workers with different skills will be needed: Micromechanical skills, microelectronic skills, skills in dealing with integrated system, programming, a basic mathematical competency.

In looking at human resource requirements for the high-technology industry, most national policy decisionmakers have been conditioned to think of scientists and engineers as the only critical personnel. Engineers and scientists are critical in generating the concepts that will serve to give the American economy the technology necessary to place our industries on a competitive level equal to or above other nations, but without doing something about the people who produce, install, and service these complex processes and machines, the retooling of the American economy will be slow—will be slowed. The technician is, in our opinion, is the critical element that has been neglected.

Scientists and engineers are able to design the processes and instrumentation, but without properly trained technicians to produce, install, program, and service the instruments and processes of high technology, the full efficiency of our high technology research and development efforts will not be realized.

Basically for each engineer or scientist, it is generally recognized that several technicians are needed to complete an efficient, cost-effective work team. The following ratios seem to apply:

In research and design of high technology products for each professional person, 3 to 5 technicians are needed. Manufacturing of high-technology products, again, for each professional, 6 to 10 are needed. In the use of high-technology products, 8 to 10 are needed; 8 to 12 are needed for each professional person.

As we move forward with the exploration and implementation of high technology instructional programs, we are experiencing extremely high costs relative to more traditional programs. Our written statement provides estimates of costs for equipment and teaching systems to prepare these technicians, and I will not go into this at this time.

In addition to hardware, we must recognize that there are software costs and costs associated with faculty training in instructional use and in instrument maintenance.

Because of the key role of software in much of the high technology training instrumentation, we request that the purchase of software be identified as an eligible expenditure under H.R. 2353.

It is clear that most community colleges have difficulty financing high-technology programs. The $20 million to be authorized for the first year is badly needed, but as can be seen by the costs being projected, at best, H.R. 2353 allows for only a few demonstration sites with limited training capabilities, and because of the rapid obsolescence of high technology instrumentation, these demonstration sites will be—will need to be updated periodically.

The Community College of Allegheny County has a particular interest in supporting H.R. 2353 for several reasons. Among these reasons are the following:

We are committed to using our resources to serve the economic development training needs of Allegheny County. And we are currently working closely with the economic development interests of Allegheny County.

We are situated in a city and county that is increasingly becoming a national center for high technology research, development, and industrial utilization.

We are the primary resource in Allegheny County for: Training dislocated workers; upgrading the employed work force; training of recent high school graduates in occupational and technical skills; providing customized training to existing firms and new firms established in the county or relocating to the county. And we operate an institute for training the severely handicapped for occupations in advanced technology.

There is no sustaining and significant source of funds for high technology program development and improvement that is presently available to community colleges. Such programs as the Vocational Education Act and the Job Training Partnership Act do not provide the kinds of funds that are needed to specifically address the technology upgrading of our delivery system.

Our technology support base for occupational programs in such areas as chemical technology, energy technology, health-related technology, and drafting and design technology is undergoing rapid obsolescence due to the technological advances being introduced.

New program thrusts are on the drawing board such as automated manufacturing technology, laser technology, and medical instrumentation requiring state-of-the-art hardware and software.

Given the rate of technological change, our faculty members need to be technologically upgraded through in-service professional development and through on-the-job experience in industrial settings.

Our neighboring community colleges in Beaver, Butler counties—Beaver, Butler, and Westmoreland Counties, and in other counties of Pennsylvania, are faced with similar situations.

In closing, American and foreign scientists and engineers have developed an extensive knowledge base for our new economic era. And in our opinion, the full development and application of these technologies for the benefit of the people of the United States and to allow us to keep pace with the rest of the world will require an investment in human resources in the next decade greater than human resource investment made by us in the last century.

Mr. Chairman, we are pleased that you are providing this leadership in—in conducting these deliberations on the National High Technician Training legislation, and we look forward to quick passage of this legislation.

Thank you very much.

[The prepared statement of Dr. Korim follows:]

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of Allegheny County

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TESTIMONY
ON
H.R. 2353
THE NATIONAL ADVANCED TECHNICIAN TRAINING ACT

BEFORE

SUBCOMMITTEE ON SCIENCE, RESEARCH, AND TECHNOLOGY
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

BY

ANDREW S. KORIM
VICE PRESIDENT FOR INSTITUTIONAL ADVANCEMENT
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PRESENTED AT

WASHINGTON, D.C.
NOVEMBER 19, 1985

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TESTIMONY OF ANDREW S. KORIM

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

NOVEMBER 19, 1985

Mr. Chairman, we believe that the work of the Subcommittee on Science, Research, and Technology of the Committee on Science and Technology has one of the most significant responsibilities of the various committees of the House of Representatives. No other sphere of Congressional activity is closer to the heart of the Nation's future than the deliberations on national science, research, and technology policy. Given the role of scientific discoveries and technological advances in world economic compeition, the United States in both its private and public sectors must continue to make huge investments in science and technology just to stay equal with foreign scientific and technological accomplishments. Further, for us to maintain a strong national defense posture, we must continue to move into more and more sophisticated defense technolgy.

As this Subcommitee conducts its business, nothing could be more important than to focus on national human resource requirements essential to the success of scientific and technological initiatives of our industry, government, and education sectors. In this regard, we at the Community College of Allegheny County believe that H.R. 2353, the National Advanced Technician Training Act, is a badly needed vehicle to address the present and future technical personnel requirements of the high technology era.

As one official of a major firm providing instrumentation needed to retool the traditional industries of Pittsburgh said recently, "We have a great new line of sophisticated high technology products and devices that we are selling to companies interested in reducing production costs, but the customers do not have the qualified people needed to use the new systems that we sell to them. So we spend a lot of time training their workers and many of them require more training than we can give them. We would rather have someone else like the Community College of Allegheny County do the training."

We are pleased that this Subcommittee is moving ahead with hearings on H.R. 2353, and we are pleased to be able to provide this testimony.

As the Community College of Allegheny County serves the education and training needs of the residents and the economy of the County of Allegheny and the City of Pittsburgh, we are faced with great contrasts. Allegheny County is basically a dual economy reflecting the degree of prior participation of the residents of the various communities in education and training. To a great extent, the well-being and the prosperity of the communities of Allegheny County increasingly relate to the level of education and training of the workers residing in those communities. Whereas in the not too distant past, the level of education and training had little to do with earning power especially in industries such as steel, today a family's purchasing power seems to be directly related to the level of education and training of the family heads.

One part of Allegheny County is thriving and another part of the County is faced with high unemployment. That part of Allegheny County that is known as the Monongahela Valley consisting of communities such as Homestead, Braddock, Duquesne, McKeesport, and Elizabeth is in the midst of a depression as serious as the Great Depression of the 1930's. In these communities, a number of steel mills and ancillary firms have shut down or have had major workforce reductions, and therefore, unemployment is high, family income has dropped, consumer businesses are faced with declining sales, property owners are experiencing a decline in real estate, and local municipalities are losing tax revenues due to the decline of real estate values.

The bulk of workers dislocated by steel mill closings possess skills that to a great extent are unique to the steel industry, but with proper assessment and proper retraining these workers can be prepared for new occupations in new industries. These dislocated workers represent a rich human resource characterized by a strong work ethic, but their transition to new jobs in new fields has been hampered by the fact that many of them are suffering from serious literacy deficiencies particularly in learning skills in computation, communications, and science and from a form of technological backwardness that comes from employment in one mill and in one job for most of their working years. Consequently, each worker for the most part not only needs training and retraining for a new job, but that training requires that the worker have the readiness and willingness to learn the skills and competencies of a different job in a different industry. Many of the dislocated workers face an enormous transition given the high technology skill requirements of labor market demand today. This condition is not unique to Pittsburgh and Allegheny County, but faces many areas of the Nation undergoing structural changes in their respective economies. Obviously, H.R. 2353 can be of great assistance in addressing these retraining or cross training needs of dislocated workers.

The other part of the dual economy of Allegheny County is experiencing economic recovery. Much of this recovery is stimulated by the infusion of high technology in the economy. This part of the economy is largely characterized by research, development, and manufacturing activities that relate to advanced technology applications in medicine, industrial production, banking, and transportation. New entrepreneurial ventures have emerged from this focus on research, development, and production of high technology hardware and software. In fact, Pittsburgh is increasingly becoming known as a national high technology research and development center. This part of the economy to a great extent is characterized by a workforce with professional and technical preparation in the sciences and the new technologies and by regular participation in education and training related to technological advances.

In a recent survey of high technology companies in the Pittsburgh area by the Pittsburgh High Technology Council, as reported in the Pittsburgh Business Times-Journal for November 4-9, 1985, employment growth in the high technology industry between 1983 and 1984 was 34 percent and between 1984 and 1985 the projected growth in high technology employment is estimated at 18.5 percent, which translates to 40,000 individuals or about 20 percent of the area's workforce.

The Pittsburgh High Technology Council has identified the structure of the high technology industry in the Pittsburgh area as follows:

Computer Software (includes software and artificial intelligence)	25%
Industry Automation (includes rototics, instrumentation, and control systems)	22%
Electronic Components, Computer Hardware	13%
Advanced Materials (including primary metals and chemicals)	11%
Energy Related	10%
Medical, Biomedical	9%
Telecommunications	5%
Other Segments	5%

Of the firms making up the high technology industry in the Pittsburgh area, more than half were found to be manufacturing firms and about 30 percent were in research and development or service businesses. Of the 263 high technology companies in the Pittsburgh area nearly half of them were founded in the last five years.

Clearly, the configuration of the economy of the Pittsburgh area is changing extensively, and as can be seen in the findings of the Pittsburgh High

Technology Council, a large share of the high technology industry is presently made up of firms involved in generating artificial intelligence and the application of this artificial intelligence to industrial processes and factory automation.

Indeed, we have entered a new economic era, an era which requires human beings to be able to interact with machines that have a programmed intelligence quotient (IQ). Machines that can be programmed with an IQ enabling them to make judgements about quality and make decisions on the adjustments that must be made in the production process to improve quality is quite a new phenomenon.

If machines can be programmed to have IQ's, then the demand for workers in the near future will obviously take a totally new configuration than that which has been the case in the recent past. This does not mean that there will not be a demand for a human workforce. This simply means that workers with different skills will be needed.

In looking at human resource requirements for the high technology industry, most national policy decision makers have been conditioned to think of scientists and engineers as the only critical personnel. Engineers and scientists are critical in generating the concepts that will serve to give the American economy the technology necessary to place our industries on a competitive level equal to or above other nations, but without doing something about the people who produce, install, and service these complex processes and machines, the retooling of the American economy will be slowed. The technician is in our opinion the critical element that has been neglected. Scientists and engineers are able to design the processes and instrumentation but without properly trained technicians to produce, install, program, and service the instruments and processes of high technology, the full efficiency of our high technology research and development efforts will not be realized.

For each engineer or scientist, it is generally recognized that several technicians are needed to complete an efficient, cost-effective work team. The following ratios seem to apply:

Type of Work	Professionals with Doctorate, Master, and Bachelor Degrees	Technicians with Associate Degrees
Research and Design of High Technology Products	1	3-5
Manufacture of High Technology Products	1	6-10
Use of High Technology Products	1	8-12

Although a difference of opinion on the ratio of technician to scientist and professional engineer may exist, the point that cannot be disputed is that for each professional several technicians are needed; otherwise the scientist and the engineer are unable to carry out their work on a cost-effective basis.

As we move forward with the exploration and implementation of high technology instructional programs, we are experiencing high costs relative to more traditional programs. The following are estimates of costs for equipment in selected high technology program categories:

Programmable controller laboratory	$120,000
Numerical control technology teaching unit with turning and machining capabilities	$ 70,000
Robotics teaching system	$500,000
Computer assisted drafting laboratory	$190,000
Telecommunications laboratory,	$150,000
Laser technology laboratory	$250,000
Computer assisted chemical technology laborabory	$120,000

In addition to hardware, we must recognize that there are software costs and costs associated with faculty training in instructional use and instrument maintenance.

Because of the key role of software in much of high technology training instrumentation, we request that the purchase of software be identified as an eligible expenditure under H.R. 2353.

It is clear that most community colleges would have difficulty financing high technology programs. The $20,000,000 to be authorized for the first year in H.R. 2353 is badly needed, but as can be seen by the costs being projected, at best H.R. 2353 allows for only a few demonstration sites with limited training capabilities, and because of the rapid obsolescence of high technology instrumentation, these demonstration sites will need to be up-dated periodically.

Given the realities of the cost of implementing high technology training programs, the partnership concept becomes critical. We are pleased to see the emphasis in H.R. 2353 on partnerships between community colleges and local private sector interests. Generally speaking, the private sector, especially corporations and foundations, has not made significant financial contributions to community colleges. We sometimes do receive equipment donations either on a lease-free loan basis or as an outright transfer of ownership. Further, we often receive professional staff time free of charge from corporations and labor organizations to assist in the development of instructional programs. However, we believe that tax incentives are needed to leverage corporate participation on a broad scale.

Partnership arrangements with the private sector are valuable not only because of the financial participation, but it is through such arrangements that our faculty and our programs are able to stay current with the cutting edge of technological developments in the corporate community.

Why is the Community College of Allegheny County supportive of H.R. 2353? There are several reasons for our interest and support as follows:

1. We are committed to using our resources to serve the economic development training needs of Allegheny County.

2. We are situated in a City and County that is increasingly becoming a national center for high technology research, development, and industrial utilization.
3. We are the primary resource in Allegheny County for:
   a. Training dislocated workers.
   b. Upgrading the employed workforce.
   c. Training of recent high school graduates in occupational and technical skills.
   d. Providing customized training to existing firms and new firms established in Allegheny County or relocating to the County.
4. There is no sustaining and significant source of funds for high technology program development and improvement that is presently available to community colleges.
5. Our technological support base (equipment, instrumentation) for occupational programs in such areas as chemical technology, energy technology, health related technology, and drafting and design technology is undergoing rapid obsolescence due to the technological advances being introduced.
6. New program thrusts are on the drawing board such as automated manufacturing technology, laser technology, and medical instrumentation requiring state-of-the-art hardware and software.
7. Our faculty members need to be technologically upgraded through inservice professional development and through on the job experience in industrial settings.

In closing, American and foreign scientists and engineers have developed the knowledge base for a new economic era characterized by:

- instrumentation with submicron precision
- artificial intelligence complementing human intelligence

- exotic life support devices and pharmaceuticals
- interplanetary travel
- gravity-free non-Earth industrial production
- ultra powerful energy sources.

In our opinion, the full development and application of these technologies for the benefit of the people of the United States and to allow us to keep pace with the rest of the world will require an investment in human resources in the next decade greater than that human resource investment made by us in the last century.

The greatest human resource shortages that will face us will be technicians capable of performing the work needed to convert that base into economically feasible applications. The investment in human resources because of its magnitude must be by necessity composed of both public and private interests. The legislation being proposed in H.R. 2353, the National Advanced Technician Training Act, is an important beginning in the recognition of the need to leverage public and private investment in technician capabilities commensurate with the human resource requirements of the high technology economic era. The level of the Federal share of the investment in H.R. 2353 obviously is not intended to do the total job but it will serve the important purpose of activating a limited number of demonstration programs by community colleges in partnership with private sector interests.

We urge quick passage of the National Advanced Technician Training Act.

Mr. Chariman, we are pleased to have had this opportunity to share our views with this important subcommittee.

Mr. **Walgren**. Thank you very much, Dr. Korim.

Let me ask for comments on the—the idea expressed earlier that there is an awful lot of money in the Department of Education and the private training sector, and that, therefore, I guess this—the conclusion is, is that no further funds are really at issue. I'm not so sure that that's the thrust of this bill in terms of providing funds, but I guess the idea is that enough is being done.

Would anyone like to comment on that portion of previous testimony?

Mr. **Anderson**. I would like to comment from two different perspectives. One is, the whole concept of causing local and State officials to recognize that a tighter interrelationship between educational institutions, government at all levels, and business and industry, is something that on the surface sounds natural. But when you get back home, it becomes unnatural. We have a long history in this country of trying to separate government, educational institutions, and the private sector. So when we try to pull together what should be these natural alliances to help produce the most efficient and effective training programs to help make industries profitable as possible, the concept of trying to do that locally are very difficult.

In Wisconsin, it took us almost 10 years to get statutory changes to allow us to do some of these kinds of things. The way things normally work in most States, it will take us another 10 years before we will be truly productive in being able to do that.

The concepts found in this bill that embody these precepts, we think are vital for this interrelationship to develop. You have heard a variety of testimonies indicating that perhaps a relationship with the National Science Foundation may not be the most appropriate way to go. You have heard comments concerning JTPA and other types of Federal programs, Carl Perkins bill, and all the various other types of Federal funding. But one of the key comments was made earlier this morning, and that is that most of those bills are designed around specific special interests. The Carl Perkins bill, as much as we would like to think at the postsecondary level, has opened the door for community colleges and technical institutes to get in to using those Federal dollars, are still in many States, very, very difficult for 2-year institutions to get at. It doesn't happen to be true in Wisconsin, but in many other States it is.

JTPA dollars are zeroed in heavily towards short-term, quick-fix programs to get the most employable displaced worker on the job. Now, that's what the reality is of JTPA; whether we like that or not, it's irrelevant. The reality is quick, short-term programs to take someone off the unemployment roll and get them onto an employment roll.

The relationship to those types of training programs and the issues that have been addressed this morning concerning the need for high level technically trained people, basically to your associate degree level employees makes it very difficult to use Carl Perkins moneys and very difficult to use JTPA moneys to get toward that goal.

I will not dispute that the original goals of those bills aren't of high value. I am just saying that it becomes very difficult for us to get at that. That's one part.

The other part, though, goes back to what I said earlier on technology transfer. We are spending literally billions of dollars in this country trying to find ways to stay at the cutting edge from a scientific and a manufacturing perception in order to be able to compete on an international level. Where we are failing miserably is transferring that to the actual work force. At the smaller-and middle-size companies, manufacturers of products or services that are high-technology oriented services.

That's why I personally think that some kind of an interrelationship with the National Science Foundation will ease that process. I am not certain whether the bill as it is currently written is going to do that. But I think we have to have some kind of a forced relationship. And I have to say forced because I think everyone knows that the National Science Foundation and the 2-year community colleges, technical colleges, and technical institutes have no natural interface. And we have got to find a way to cause interface to occur. And this bill may be one of those ways that we can find a legitimate process to help that along and nurture that.

Mr. **Walgren**. Are there other comments on the same subject? Dr. Schafer?

Mr. **Schafer**. Yes, I—I think if any of us gave the impression that there's sufficient resources to accomplish the task, we were misread.

My concern is that existing programs only provide a drop in the bucket in terms of what we need to be able to provide. But they already provide the structure within the—within which the right things could happen. The description, particularly in the findings of H.R. 2353, are a statement for the need for technical training and community colleges as the vehicle for that training, that—with my reading—is unequaled in terms of recognition within the Federal Government.

I wish those people administering existing Federal programs could read and understand that. For example, existing programs, even within the National Science Foundation, for example, in technical equipment and instrumentation—we heard this morning, while that certainly is open to community colleges, no—no community college participation could readily be identified. Obviously, the—the staff of the National Science Foundation does not see their specific charge as—as including the community college as—as a service delivery vehicle.

My concern is not that we have sufficient funds, or incentives, or programs, but rather, one more program, particularly in a reluctant agency, is not going to solve the problem.

Mr. **Walgren**. But you—you indicated that you found 21 agencies that are sort of aimed at this partnership concept. And Dr. Anderson says it's very difficult to get that partnership going and it took them a number of years to—to break down a certain barrier.

Wouldn't that indicate that—that if there were some way to—to do some high visibility demonstration, that that would help those partnerships be picked up more readily within the communities themselves without, you know, having to be part of this program?

But if we could show that this is the—that this is really the way to—to—the best way that we know to make something good happen, the visibility of this program, I think, may be the thing that recommends it the most.

Mr. OWEN. Mr. Chairman, I would certainly agree with that. I believe our communities understand the National Science Foundation. And if we did have such a grant, we would be very successful in being able to work through our local foundation in our local business and industry to raise the necessary funds and to do, I think, a superb job of developing a program of excellence in the area that we chose to—to work.

Mr. WALGREN. But then I have to ask Dr. Schafer whether in that light, even though this would be the 22d of the 21, wouldn't this have something very unique that it could contribute and perhaps eliminate the need for having so many attempts to pursue the same thing?

Mr. SCHAFER. I respectfully suggest that while that is a potential, the same potential could well be realized again. For example, I serve on the private industry council in Oneida-Madison-Herkimer Counties. I know of no one on that council, whether from private industry or from the public sector, who would not support the purposes as outlined in the literature describing 2353. I know no one on the staff of the agencies that work under JTPA who would not support that. When I ask why we cannot deliver the things which are so much more effectively articulated than I can say from this morning in the findings of 2353 we hear because it's the Feds and their regulations. This is the wrong chamber, perhaps, to be stating that in, but it's restrictions under existing legislation and rules and regulations that have come out of the Department of Labor or the Department of Education which keep us from doing the job and demonstrating excellence rather than fostering demonstration projects and fostering excellence.

I sit with colleagues who I know each run the kind of model programs in a very limited fashion, but we each run the kind of model programs that you would have us run. We do that in spite of Federal regulation rather than because of Federal support.

Mr. BOEHLERT. Mr. Chairman, may I?

Mr. WALGREN. Mr. Boehlert.

Mr. BOEHLERT. I would agree with Dr. Korim. The investment in human resource, I think, is the best investment we can make. And no one up here would suggest that we have adequate funding for this type of training and retraining program. And certainly, the $80 million authorized over a three-year period in this bill is a very modest investment. I think we are—we are—we could do much better. So I am not quarreling with any of those givens. But I am suggesting, to follow on to what Dr. Schafer is saying, that while I recognize the need for more money, I think the greater need is to refocus some of the existing programs rather to add one more new program, and have the existing agencies, like the Department of Education, or Labor, work with, on a consultant basis, the National Science Foundation. But you've all testified, and everyone that comes before this committee testifies, that NSF really hasn't done what it should be doing already with existing programs in terms of the community college needs. And we've got a hell of a battle on our hands just to convince them to do that for instrumentation and equipment. And I am willing to make the commitment of dolllars; I am willing to make the commitment of effort, but I am not convinced that we need another agency involvement with a new program when we already have so many programs that maybe should be refocused.

Mr. KORIM. Historically what we're talking about here are basically two kinds of programs: the Vocational Education Act and the old Manpower Development Training Act, the CETA, and now the Job Training Partnership Act. And in the case of the Vocational Education Act, historically, community colleges have not been able to participate. In fact, in the recent Carl Perkins Act, the share for community colleges was cut back from 15 percent as a floor to about 8½ percent. This is the signal to the States that community colleges aren't that important. But yet, we are serving probably the greatest portion of the labor market needs. We've heard people saying that in addition to preparing elementary and secondary school people, or people getting ready to enter the world of work, we need to work in terms of upgrading people. And it is extremely difficult to use those Vocational Ed Act funds for that purpose.

In the case of the Job Training Partnership Act, the purpose of the law is different than what we are talking about here. If you can amend that law to put focus on expanding and improving, upgrading the delivery capability of institutions, then those funds would be probably put—be put to better use. As it is right now, JTPA is client focused, focusing on an individual's needs to get some basic training, education of a short-term nature, and this person is generally a hardcore unemployed person, a person who—who has had difficulty making an entry into the labor market, has had probably very little prior experience in—in the work force. And that is what that money is being used for.

Mr. BOEHLERT. Let me ask you this, Dr. Korim, if I may interject. As a general rule, wouldn't you agree that where existing programs are not clearly meeting the full need we perceive for them, it would be better to refocus the existing programs, perhaps expand the mission—the mission somewhat—to accommodate the deficiencies that you have enumerated, rather than create one more program and one more agency.

I am just concerned—I am willing—I will spend that—I'll sign the check today for that $80 million. I'm totally committed to that. That's the best investment we can make: the investment in human resources, to allow people to be gainfully employed, or to earn a better living. But I'm not certain of the direction. And that's where we're looking for some guidance.

Mr. KORIM. Well, if we could somehow, in H.R. 2353, get a provision in there that would lop off a—a good chunk of JTPA and Vocational Ed Act money and transfer those funds to the National Science Foundation with specific language to earmark those funds for these purposes, then we might be able to do that without really creating a totally new pool of funds. We do have to look at ways of facing up with our deficit situation. But the existing agencies like the Department of Education, and their—and their respective agencies in the States that administer the Vocational Ed Act, or that eight percent money under the Job Training Partnership Act, are taking their signals from—from the legislation that's on the books. If we amend that legislation on the books through this H.R. 2353 and then pull those funds off and put them in the NSF, I think we will get the kind of focus on human resource investment that is needed.

But I don't have the kind of confidence that I hear some other people saying about the Department of Education being able to do this or the Department of Labor being able to do this. I think it's got to be—this money's got to be pulled out of their control and put into the NSF, or into a similar or perhaps as I heard someone say, the Commerce Department is very much interested in this problem. I don't have the kind of confidence I hear some people saying that we should have in terms of the Department of Ed focus.

Mr. **Boehlert**. Well, if we use—if we use Dr. Schafer's—I may be indulged further, Mr. Chairman—if we use Dr. Schafer's figures and theory, well, we already have 21, and we don't really need 22, and I'll accept that, and that's the basic premise I'm operating on. Keep in mind that these departments that we are talking about, that are not doing what we think they should be doing, operate under our direction. Maybe we just have to give them new direction. Part of the problem in Washington—and, incidentally, since this hearing started, we spent $45 million just in interest on the national debt, just since this hearing started at 9:30 this morning. That's a serious problem. And we can't ignore that.

But given that, I—so if I can save some money in administration and use the money to do what I really want to do—train the people—I'll do it. And if you set it up—a new program and a new agency, you've got more administrative money. Why not use the limited resources we have in the existing agencies, who are given marching orders, and they will march to the tune that we all call. Because I am just absolutely enamored with the community colleges as the—perhaps the best vehicle in America today to provide the type of training we're discussing. And there's been dramatic improvement from CETA to JTPA. And one of the reasons that we have such significant improvement is you don't have government running the programs anymore like they did under CETA—you—you're utilizing the talents and energies of the community colleges, and we are doing it very effectively. I see in New York, I see a model institution like Mohawk Valley Community College, and that's how I learn from example. And I would like to just expand that operation.

Thank you, Mr. Chairman.

Mr. **Owen**. Mr. Chairman, to comment on——

Mr. **Walgren**. Mr. Owen.

Mr. **Owen** [continuing]. Mr. Boehlert and Dr. Korim. All of us here on the panel serve actively with private industry councils and all of us are involved in those activities. But I noticed last week where the National Association of Counties had their meeting in Atlanta. And the research and studies that were conducted at that meeting tended to indicate that the representatives there did not want to change the Job Training Partnership Act in the way it's currently working. They feel as though the way it's working is the way it should and ought to work. Therefore, I think Mr. Boehlert's comments are appropriate: if new direction is to be given, it needs to come from here.

Mr. **Boehlert**. But—if I may respond to that. As a former good dues-paying member of NACO I know the problem. Here's what happened: When we went from CETA, which just was not working as intended, and wasting millions of taxpayers' dollars ever—every year in a noble cause created a monumental problem for all those NACO members you're talking about. Because I used to be one of them as a county executive—and suddenly with a new direction to a program, I discovered I had a lot of people working for me. Patronage, if you will—I'd like to think we had all professionals in my government, but we are going to be suddenly unemployed because the direction was going—it was a new direction, into the private sector. But all over the country, you had county officials doing their best to guard their turf and protect those jobs. That's what happened. And that's why you are seeing that response.

I just hope that—I don't want my remarks misconstrued. I am just committed to providing the dollars necessary for training and—and upgrading skills, because we absolutely need it to remain competitive in this international marketplace. And I'm afraid others are doing it better than we are. And I want to be part of the solution, not part of the problem. But—and one further observation and then I'll be quiet.

This committee has the highest regard for the National Science Foundation. That's our charge. We work daily with them and I have great respect for them, and so do you, as you indicated by your statement, Dr. Owen. But I would suggest to you that all across America, people don't even know what NSF stands for. The President, in this very, very tight budget in which a lot of programs were recommended for elimination, others were recommended for drastic cutbacks in funding, recommended an increase in funding for NSF. And we stood up in this committee and applauded and tried to carry that to the floor and press the need—got frozen like all the other programs. So just—don't be so enamored with the—with a label NSF, for seal of approval, that everybody's going to say, great, we'll support this program. It doesn't happen that way, unfortunately.

Mr. **Walgren**. Well, the—let me understand. Did the NACO people do what in their resolution?

Mr. **Owen**. I don't know if it was a resolution, Mr. Chairman, as much as it was an expression that they felt that JTPA was working well and should continue as it is.

Mr. **Walgren**. Yeah, that's so different than I thought.

Mr. **Boehlert**. That's not incompatible, because JTPA is working well, as a matter of fact. And it's a major improvement over its predecessor, CETA. That doesn't mean—it should not be exposed to that dynamics of the changing marketplace and the changing need—and that's our obligation, to provide some new direction, perhaps.

Mr. **Walgren**. The difficulty we have is that—that this committee is particularly sensitive to the scientific side of things, and I think particularly sensitive to the kinds of—of future implications that Dr. Choate would raise, and has a tradition of trying to—trying to anticipate the future. That's not quite the same with the other committees that would have immediate jurisdiction over trying to remove their education funds and transfer them to some even other purpose, let alone other agency, or—or job training funds. And—and I think that, as a practical matter, it's hard to project that—that redirection happening.

Now, I guess what I'm wondering is there are two reasons to withhold—one, because we think that we could redirect other agencies and use moneys that the other agencies now are directing in another way for this purpose.

Mr. **Boehlert**. I think we all agree on that. And the existing dollars are not sufficient to meet the need.

Mr. **Walgren**. And I'm sure from their point of view, their dollars are really used to the hilt and Lord knows, they've got enough hard core unemployed to retrain, that—that will take care of the Job Training Partnership moneys that are presently there. And the same thing is true, I'm sure, of the education dollars. From their point of view, they probably feel that all those dollars are really inadequate to do what they see in their immediate area. So it does look like if anything is to happen, we need some additional money, or some additional money.

And then the remaining question is, once you say, well, all right, we are going to approach this with the philosophy that there ought to be some additional money, then—then the only question is, what vehicle do you use to—to conduct that effort.

Mr. **Boehlert**. Mr. Chairman, it all boils down to this: I want those dollars to go in human capital, not for more administrative charges. I want you to have the money out there, in the real world. And I don't want to spend one more dollar in administration here when we can use the existing administrative vehicles within the existing agencies charged to deal with the issue, and refocus their direction, perhaps, a little bit.

Mr. **Walgren**. Yeah. But if the gentleman would yield. That would—that would argue for the NSF in the sense that—that I think we do instinctively know that there's a more complete bureaucratic administrative overlay in the larger—larger governmental departments.

Mr. **Boehlert**. Spoken like a proud author. [Laughter.]

Mr. **Walgren**. And I do want to—to encourage people to appreciate the ability of the NSF to get in and get out of operations, and to bring some kind of—of targeted effort, that we seem to have such problems creating in these larger agencies. And in that sense, I think the NSF could probably do this with less administrative cost than certainly the Department of Education might do it.

Mr. **Boehlert**. Perhaps like Dr. Schafer, I would have been a little more comfortable with that proposition had Dr. Moore been able to cite some examples of where the NSF, despite all the direction given from this committee, has earmarked resources to community colleges across America. And he drew a total blank. And I have great respect for NSF, but—strike the "but."

Mr. **Walgren**. Well, oh, I'm sorry.

Mr. **Anderson**. Mr. Chairman.

Mr. **Walgren**. Mr. Anderson.

Mr. **Anderson**. I wanted to make sure that you—the committee got on record the concept of, at least from our district, the strong support for the matching type funds coming from the local communities.

Mr. **Walgren**. Yes.

Mr. **Anderson**. The private sector is not immune to the issue that there are not enough Federal dollars available, or there are not enough local dollars or State dollars available. They also recognize, as Dr. Choate indicated earlier, that they do have a commitment. And we are finding that even without the kind of incentive we're looking for coming from this particular bill, that we're finding ready allies in the private sector who are willing to put some pretty big bucks up, and they are out there. But they, themselves, can't do it all either. And so that the whole concept of matching local dollars, whether they come strictly from the private sector or from property taxes, or State revenues, is something that I think—non-Federal dollars is something that should be included in this concept no matter where it goes.

Mr. **Boehlert**. Let me ask all of you, if I may. Drop for a moment the discussion on whether it should be NSF or Education or Commerce. What is your greatest unmet need? If the $80 million is made available, where would you use it? Would it be for faculty? Would it be for curricula development? Would it be for equipment? What—where is the greatest unmet need?

Now, I know you have a lot of them, but I——

Mr. **Owen**. All three.

Mr. **Anderson**. All three.

Mr. **Boehlert**. All three? OK. That shows my familiarity with the problems of community colleges in America. And, incidentally, I have a couple more—you didn't mention them.

Would all of you agree, is there anything that we've missed?

Mr. **Korim**. I think that you've pretty well hit it. In terms of equipment, the rate of change is so rapid that equipment is constantly falling into the category of being obsolete. We are really in—an era of exploding knowledge in a way that that may have been the case a couple of decades ago, but today the application of that knowledge to actually useful, industrial processes, and to improve the quality of life is so extensive and taking place with such a rapid pace, that our equipment base gets obsolete pretty fast.

In similar cases we're trying to catch up with typewriters that are obsolete. And we're——

Mr. **Boehlert**. Dr. Korim, if I may right here—may I? Would you leave your card with me?

Mr. **Korim**. Certainly.

Mr. **Boehlert**. Because the Smith-Corona Corp., in Cortland, NY, in my district, has just developed a very low-cost, high-technology machine that I would like to interest you in. [Laughter.]

Mr. **Korim**. We—we're always desirous of, and we're moving toward, improving the quality of our equipment by moving into word processing in this area. But if you get into the other technologies, we would like to get a factory automation program going. That, obviously, is something that we don't have the resources for. And there are numerous other program areas that relate to the changes taking place in the industry in Pittsburgh. And I suspect it's true in a lot of parts of the country where we have a huge industrial concentration and the need for upgrading things in industry.

So our big need is equipment. But then, second, we'd say faculty.

Mr. **Boehlert**. Dr. Schafer?

Mr. **Korim**. Faculty advancement.

Mr. **Schafer**. Yeah, I think I—I'd put those two in a very close tie. I can only speak of the difficulty of employing people to teach effectively in electrical engineering technology, for example, where our average 2-year associate degree graduate, the average one, was placed at $17,500 a year, last year. The highest placement of an associate degree graduate was $28,500 in our local area. And I'm able to pay an assistant professor approximately $20,000 a year who has been teaching that student.

The only way we can offer those programs is to upgrade existing faculty, and that there are virtually no resources for.

Another myth—well-sounding myth—is go to that industry and let them use their high technology equipment for training workers—workers to work in those industries. That would be great if they weren't using that as a way to—I picture fingernails climbing up a wall to hold on because their high-tech equipment is—is in production, three and—three shifts, 7 days a week. They don't want some freshman kid working on it, who might shut down an entire shift, or work period.

So—so again, while that—that equipment is in industry, and you are saying—we're saying industry is—are the ones that are going to have those workers, it is frequently in—impractical, particularly at the community college level, to put freshmen and sophomores in a real learning experience on that. So—so our equipment needs are—are much like Dr. Korim's.

I think we do have the energy and expertise, in large part, for curriculum development, however.

Mr. **Boehlert**. Dr. Anderson?

Mr. **Anderson**. Following right back on that topic, in Wisconsin we are trying to write some legislation now. It was entered into one House and didn't make it through last year, but we think it's going to make it this year. Using in the computer—designer computers assisted manufacturing areas, which we all have very, very similar problems, what Dr. Schafer indicated is absolutely correct: we can't get our students in, nor can we get our faculty in even to become upgraded.

What we are trying to do in Wisconsin is to give a more rapid depreciation of that equipment so that we can get some spot placements of students and faculty in to meet within the schedule—the working schedule, of that industry.

In order to have an industry try to accommodate some specialized activities, not full semester programming, but short-term things that—the accumulation of our training programs, they truly need to have some incentives. And so we are going the route of—of trying to give them more rapid depreciation on that equipment. If we sign a regular contracted relationship with that industry that they will guarantee us *x* number of hours utilizing that equipment, and that actually happens, through an audit trail process, they will get more rapid tax depreciation on the equipment. But that's the only way we were able to get any type of on-job-site relationships with industry because, as Dr. Schafer indicated, those are real problems, and it's very difficult to do that.

Mr. **Walgren**. Well, OK. Well, let me, on behalf of all our colleagues here, thank you for being a resource to us. And with that, we will conclude the hearing. Thank you.

[Whereupon, at 12:35 p.m., the subcommittee was adjourned.]

APPENDIX

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Congressional Record

H.R. 2353

COMMUNITY COLLEGES: A TRAINING GROUND FOR TECHNOLOGY

HON. DOUG WALGREN

OF PENNSYLVANIA

IN THE HOUSE OF REPRESENTATIVES

Thursday, May 9, 1985

• Mr. WALGREN. Mr. Speaker, the high technology revolution in the workplace can mean new jobs. It can also mean lost jobs. Technology can offer great promise; it can also bring great pain. We must try to make sure we have the training resources workers need to adapt to the new technologies.

On May 2, I introduced H.R. 2353, the National Advanced Technician Training Act [NATTA], to establish a program in community and technical colleges for training young people and adults in advanced technology fields.

The bill can draw on the unique resources of the Nation's community college network—the largest, most flexible arm of higher education with strong ties to local employers.

THE WORKPLACE OF THE FUTURE

Employment in high technology areas is expected to increase more than 100 percent by 1990—more than four times the employment growth rate in all other kinds of occupations. Some have said that today's technological transition is comparable to the industrial revolution. Pat Choate, in "Retooling the American Work Force," has observed:

> The speed and force of * * * change will be awesome * * *. Consequently, millions of jobs and workers will become obsolete * * *. In this decade virtually all of the nation's workers will need to be retrained or have their skills sharpened.

Some projections: Data processing jobs will grow by 148 percent, programming jobs will jump by 74 percent; computer analysts will increase by 108 percent. By 1990, almost half of American workers will use technical equipment daily.

What does all this mean? In some cases, it means new jobs. In some cases, it means "old" jobs eliminated. In some cases, it means jobs take a new form. In almost all cases, it means workers will have to learn new skills and knowledge. Most of these workers are now in the work force.

The National Advanced Technician Training Act attempts to adjust to this job revolution by creating a matching grant program in the National Science Foundation to help community colleges develop model programs to train and retrain workers of all ages. $20 million would be authorized for the first year; each grant would be matched by non-Federal funds, such as local government or private industry. In my own home area, Allegheny County government has contributed $1 million to our local community college to a program for displaced workers. Funds would be used to develop programs and courses, train faculty, organize cooperative training programs with local industry, and purchase necessary equipment.

The bill would direct NSF to consider several important criteria in awarding grants: people in need of retraining or upgrading to retain their jobs; workers dislocated by plant closings and technological change; working people and parents who need flexible scheduling; young people just out of high school; high school dropouts; and handicapped people with special needs.

WHY COMMUNITY COLLEGES?

Community colleges are the ideal places for retraining. They can offer low-cost programs with flexible scheduling. This is particularly important to adults with jobs and families—almost 80 percent of present community college students are non-college age. Community colleges can design programs with local industry—often on-the-job training—specifically designed to meet local industry's needs. They can attract faculty from industry, people to teach parttime in a field related to their work.

The community college is an especially good training ground for displaced workers, people whose jobs are eliminated because of a plant shutdown, retooling with new equipment, or changes in the economy. From 1979 to 1984, 5.1 million jobs were lost in the United States. By 1984, 25 percent of those unemployed were still looking for jobs. In areas like mine, we are still wading through the aftermath of the recession. Steel industry employment has been cut in half. Studies of automation in the workplace tell us that technological innovations in manufacturing industries will exacerbate unemployment in the Northeast, where manufacturing industries like metalworking are concentrated.

STAYING COMPETITIVE

We are awash with studies and headlines decrying the decline of our industries and products in the international marketplace and the fact that many of our products are not competitive with those from Japan or other Third World producers. We are told that Japan's steel mills produce an average of 700 to 1,000 tons per year per employee, twice the rate of American steelworkers in traditional American plants. The hope of many of our industries is modernization, technological and process innovations to put our products back in competition with those from other countries. This country's trade deficit has reached unprecedented levels, almost $130 billion this year. Without a skilled technical work force, we will never catch up. This bill could be a good start.

The Red Queen in "Alice in Wonderland," gives us guidance: "* * * it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that." We had better get moving.

I hope my colleagues will lend their support to this bill to make a major effort in technician training through community colleges and trade schools.•

99TH CONGRESS
1ST SESSION

H. R. 2353

To establish a national advanced technician training program, utilizing the resources of the Nation's two-year community and technical colleges to expand the pool of skilled technicians in strategic advanced-technology fields, to increase the productivity of the Nation's industries, to contribute to the self-sufficiency of the United States in strategic advanced-technology fields, and to improve the competitiveness of the United States in international trade, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 2, 1985

Mr. WALGREN introduced the following bill; which was referred jointly to the Committees on Education and Labor and Science and Technology

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A BILL

To establish a national advanced technician training program, utilizing the resources of the Nation's two-year community and technical colleges to expand the pool of skilled technicians in strategic advanced-technology fields, to increase the productivity of the Nation's industries, to contribute to the self-sufficiency of the United States in strategic advanced-technology fields, and to improve the competitiveness of the United States in international trade, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Advanced Technician Training Act".

STATEMENT OF FINDINGS

SEC. 2. The Congress finds that—

(1) the United States has no comprehensive strategy to develop and maintain the technically trained workforce needed for self-sufficiency in strategic advanced-technology fields, for the improvement of productivity of the Nation's industries, for the strengthening of our industries in competitive international markets, and for the reindustrialization of declining industrial areas of the Nation;

(2) there is a shortage of technically trained workers to fill the needs of industries for technicians to produce, operate, and service highly technical equipment, systems, and processes;

(3) many dislocated workers and unemployed adults lack the training to meet industry's technological needs, and there is no promise of this condition being self-correcting;

(4) the United States has become increasingly dependent upon foreign producers for advanced-technology equipment needed for reindustrialization and economic growth, undermining the United States' self-sufficiency and economic independence in strategic advanced-technology fields;

(5) some industries in the United States are experiencing a decline in productivity and profitability partly due to outdated plant, equipment, and processes and imbalances between advancing technology and the workforce necessary to efficiently utilize the technology;

(6) the Nation's workforce is in need of continual upgrading to produce, operate, and service advanced-technology systems, to increase the productivity and profitability of industry, and to enable the United States to reduce its dependency upon foreign producers;

(7) many adults have deficiencies in basic computational, communications, and problem-solving skills that weaken their productivity and hamper their employment in increasingly complex technological work settings;

(8) the Nation's two-year community and technical colleges have become American education's leading source of the competency-based technical training and short-cycle retraining which is required to meet industry needs and to increase the level of technical, computational, and communications skills in advancing technology;

(9) a national strategy is needed to stimulate the increased collaboration between community and technical colleges and private sector industrial, commercial, and labor interests essential to the development of skilled advanced technicians needed for economic growth, industrial development, and reindustrialization;

(10) national defense readiness can be enhanced by advanced technician training, designed to produce technicians in strategic advanced-technology fields and to increase national self-sufficiency in these fields; and

(11) a national advanced technician training program will give men and women from all backgrounds more opportunities to pursue training and education programs leading to an associate degree or technical certificate or otherwise to upgrade their competence consistent with the emerging needs of business and industry.

PURPOSE

SEC. 3. It is the purpose of this Act to establish a national advanced technician training program in the Nation's two-year community and technical colleges, with matching non-Federal funds, to—

(1) expand the skilled workforce needed to make the Nation self-sufficient in strategic advanced-technology fields, to increase the productivity of our Nation's industries, to improve the competitiveness of the

United States in international trade, and to increase the Nation's military preparedness;

(2) prepare technicians and skilled craftsmen, retrain persons whose skills need updating, and upgrade employed technicians to enable them to be productive in strategic new and emerging advanced-technology fields;

(3) provide industries in the United States with a highly skilled workforce capable of producing, operating, and servicing the advanced technology needed to modernize the Nation's industrial complex and to revitalize the Nation's economy.

NATIONAL ADVANCED TECHNICIAN TRAINING PROGRAM

SEC. 4. (a) The Director of the National Science Foundation (hereinafter referred to as the "Director") is authorized and directed, in accordance with section 5 and the other provisions of this Act, to carry out a three-year advanced technician training program under which accredited community and technical colleges, using matching non-Federal funds, will provide training in technical competencies in strategic fields. Such program shall include emphasis on on-the-job training intermixed with technical occupational training and shall place special recruiting emphasis on attracting men and women to the program who are in need of retraining or upgrading in order to retain their jobs, or who are unemployed, especially workers dislocated by plant closings and technological change, and persons who have recently completed high school or who left high school prior to graduation.

(b) In carrying out the national advanced technician training program, the Director shall—

(1) award grants on a competitive basis to accredited community and technical colleges which possess the demonstrated ability to provide competency-based occupational training; and

(2) work with the Nation's network of community and technical colleges to establish and maintain, at the National Science Foundation or by contract, a readily accessible inventory of advanced technician training programs which are serving public and private employers and addressing the changing workforce demands of emerging technology.

(c) Each community or technical college awarded a grant shall provide an associate degree training program in designated advanced-technology occupational fields in accordance with the provisions of this Act.

(d) No grant awarded to a community or technical college under this section shall exceed $500,000 per year.

(e) To assure that the national advanced technician training program is consistent with the needs of industries, the Director shall appoint a 15-member National Advisory Council on Advanced Technician Training, which shall have the responsibility of advising the Director on the goals and implementation of the program, reviewing the effectiveness of the program, and reporting annually to the Director and the Congress. The Council shall include representatives of industry, labor, community and technical colleges, the military, and economic development organizations. The chairman of the Council shall be a president or governing board chairman of a community or technical college.

(f) The Council and the Director shall prepare and submit to the Congress an annual report on the national advanced technician training program, together with—

(1) an evaluation of the program;

(2) a catalog of the community and technical college programs identified by the required inventory;

(3) a recommendation on the feasibility of expanding the program; and

(4) such other recommendations, including recommendations for legislation, as the Council and the Director deem necessary.

(g) In carrying out his duties under this section, the Director shall consult, cooperate, and coordinate with the programs and policies of the Department of Commerce and other relevant Federal agencies including the Departments of Labor, Education, and Defense.

(h) The national advanced technician training program shall give special emphasis to training programs described in subsection (c) which—

(1) include flexibility in scheduling in order to accommodate working people and parents; and

(2) take steps to meet the adaptive and training needs of handicapped young people and adults.

USE OF FUNDS

SEC. 5. Funds appropriated to carry out this Act shall be used to establish, strengthen, and expand the advanced technician training capabilities of community and technical colleges, including—

(1) the development of associate degree and short-cycle training programs in advanced-technology occupations by community and technical colleges, and by consortia of community and technical colleges, with particular emphasis on model instructional programs to prepare and upgrade technicians and to retrain dislocated workers in state-of-the-art competencies in advanced-technology occupations;

(2) the development of community and technical college faculty and instructors, both full- and part-time, in advanced-technology fields such as laser technology, robotic technology, fiber optics technology, nuclear technology, micro-mechanical technology, and computer technology, and in advanced-technology applications

that integrate and synthesize emerging and existing technologies;

(3) the establishment of innovative partnership arrangements between community and technical colleges, the private sector, and the government to enhance the exchange of technical and scientific personnel;

(4) the development of cooperative advanced technician training programs with business, industry, labor, and government;

(5) the purchase or lease of state-of-the-art instrumentation essential to training and education programs designed to prepare and upgrade technicians in new and emerging advanced-technology fields;

(6) the stimulation of private sector participation in advanced technician training programs in community and technical colleges through the sharing of program costs, equipment loans and donations, and the cooperative use of laboratories, plants, and other facilities as training sites and to provide relevant state-of-the-art work experience opportunities for students enrolled in such programs; and

(7) the development of instructional materials in support of advanced technician training programs in community and technical colleges, and the dissemina-

tion of such materials among community and technical colleges.

DEFINITIONS

SEC. 6. For purposes of this Act—

(1) the terms "advancing technology" and "advanced-technology" include or refer to advanced technical activities such as the modernization, miniaturization, integration, and computerization of electronic, hydraulic, pneumatic, laser, nuclear, chemical, telecommunication, and other technological applications to enhance productivity improvements in manufacturing, communication, transportation, commercial, and similar economic and defense activities; and

(2) the terms "community college" and "technical college" mean a two-year postsecondary educational institution that has authority to award an associate degree or comparable technical certificate and has the mission of offering comprehensive education and training services to meet the needs of a prescribed community, including a two-year junior college, technical institute, or other postsecondary educational institution offering comprehensive associate-degree programs in technical fields.

AUTHORIZATION OF APPROPRIATIONS

SEC. 7. There are authorized to be appropriated the sum of $20,000,000 for the fiscal year 1986 and the sum of

$30,000,000 for each of the fiscal years 1987 and 1988 to carry out the provisions of this Act.

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NATIONAL ADVANCED TECHNICIAN TRAINING ACT
SUMMARY

PURPOSE

TO ESTABLISH A NATIONAL ADVANCED TECHNICIAN TRAINING PROGRAM IN THE COMMUNITY AND TECHNICAL COLLEGES TO TRAIN YOUNG PEOPLE AND ADULTS IN STRATEGIC ADVANCED TECHNOLOGY FIELDS; TO HELP UPGRADE SKILLS OF CURRENT AND DISPLACED WORKERS; AND TO PROVIDE INDUSTRY WITH A WORKFORCE CAPABLE OF USING ADVANCED TECHNOLOGY NEEDED TO MODERNIZE THE NATION'S INDUSTIES.

PROGRAM

THE DIRECTOR OF THE NATIONAL SCIENCE FOUNDATION IS AUTHORIZED TO AWARD GRANTS, OF UP TO THREE YEARS, TO ACCREDITED COMMUNITY AND TECHNICAL COLLEGES FOR THE PURPOSE OF DEVELOPING TECHNICAL TRAINING IN ADVANCED TECHNOLOGY FIELDS. ALL GRANTS WILL BE AWARDED ON A COMPETATIVE BASIS AND MATCHED WITH NON-FEDERAL FUNDS (I.E. STATE AND LOCAL GOVERNMENT, INDUSTRY, AND OTHER PRIVATE SOURCES). NO GRANT COULD EXCEED $500,000.

FUNDS COULD BE USED TO:
- --DEVELOP ASSOCIATE DEGREE AND SHORT-CYCLE TRAINING PROGRAMS.
- --DEVELOP FACULTY.
- --ESTABLISH PARTNERSHIPS WITH INDUSTRY AND GOVERNMENT FOR PERSONNEL EXCHNAGE PROGRAMS.
- --DEVELOP COOPERATIVE TRAINING PROGRAMS WITH INDUSTRY, LABOR AND GOVERNMENT.
- --PURCHASE OR LEASE STATE-OF-THE-ART INSTRUCTIONAL EQUIPMENT.
- --DEVELOP AND DISSEMINATE INSTRUCTIONAL MATERIALS.

SPECIAL EMPHASIS WILL BE PLACED ON THE FOLLOWING GROUPS:
- --PEOPLE IN NEED OF RETRAINING OR UPGRADING TO KEEP THEIR JOBS.
- --WORKERS DISPLACED BY PLANT CLOSINGS AND TECHNOLOGICAL CHANGE.
- --PEOPLE WHO HAVE RECENTLY COMPLETED HIGH SCHOOL AND HIGH SCHOOL DROPOUTS.
- --WORKING PEOPLE AND PARENTS WHO NEED FLEXIBLE SCHEDULING.
- --HANDICAPPED YOUNG PEOPLE AND ADULTS WITH SPECIAL NEEDS.

AUTHORIZED FUNDING

FISCAL YEAR 1986, $20 MILLION; FISCAL YEAR 1987, $30 MILLION; AND FISCAL YEAR 1988, $30 MILLLION.

CLEARINGHOUSE

THE NATIONAL SCIENCE FOUNDATION IS DIRECTRD TO ESTABLISH AND MAINTAIN AN INVENTORY OF ADVANCED TECHNICIAN TRAINING PROGRAMS.

ADVISORY COUNCIL

THE DIRECTOR OF THE NATIONAL SCIENCE FOUNDATION IS DIRECTED TO CREATE A 15-MEMBER NATIONAL ADVISORY COUNCIL ON ADVANCED TECHNICIAN TRAINING TO ADVISE THE DIRECTOR ON THE GOALS AND IMPLEMENTATION OF THIS PROGRAM. MEMBERSHIP WOULD CONSIST OF REPRESENTATIVES OF INDUSTRY, LABOR, COMMUNITY AND TECHNICAL COLLEGES, THE MILITARY, AND ECONOMIC DEVELOPMENT ORGANIZATIONS. THE CHAIR MUST BE THE HEAD OF A COMMUNITY OR TECHNICAL COLLEGE.

DEPARTMENTAL COORDINATION

NSF IS DIRECTED TO COORDINATE ITS ACTIVITIES WITH OTHER FEDERAL AGENCIES; INCLUDING THE DEPARTMENTS OF COMMERCE, LABOR, EDUCATION, AND DEFENSE.

DEFINITION OF ADVANCED TECHNOLOGY

"AVANCED TECHNOLOGY" INCLUDES "ADVANCED TECHNICAL ACTIVITIES SUCH AS THE MODERNIZATION, MINIATURIZATION, INTEGRATION, AND COMPUTERIZATION OF ELECTRONIC, HYDRAULIC, PNEUMATIC, LASER, NUCLEAR, CHEMICAL, TELECOMMUNICATION AND OTHER TECHNOLOGICAL APPLICATIONS TO ENHANCE PRODUCTIVITY IN MANUFACTURING, COMMUNICATION, TRANSPORTATION, COMMERCIAL, AND SIMILAR ECONOMIC AND DEFENSE ACTIVITIES."

TESTIMONY OF U.S. REPRESENTATIVE BOB EDGAR ON H.R. 2353

Thank you, Mr. Chairman, for iniviting me to testify on bill, HR 2353, the National Advanced Technican Training Act, to establish a program in community and technical colleges for training young people and adults in advanced technology fields.

As you know, I was one of the early cosponsors of the HR 2353, one of the more important pieces of legislation before the House today. You are to be commended for introducing it.

I don't think I have to tell you that our nation's lock on technological innovation—and perhaps even more important, the transfer of technology to regions and industries that need it—has been slipping away from us. There are many manifestations of this loss, not the least of which is the recent fall of the United States into debtor status for the first time since 1914. We now owe more than we are taking in. Next year, if projections hold, we will have the dubious honor of being the world's largest debtor nation, ranking ahead of Mexico and Brazil, the current leaders. And there is no need in sight. The president of the New York Federal Reserve Bank has said that we would be lucky if this United States debt owed abroad is not larger than half a trillion dollars by the end of the decade.

Mr. Chairman, there are no easy answers to getting this nation, and particularly this state, back on its competitive feet again. What I don't think anybody would question, however, is that technology transfer to the regions and industries that need it critical to our economic turnaround. We can also agree that community colleges will play a critical role in this transfer. That is why your bill is so important.

Loss of industry coupled with unemployment have generated the demand for community colleges to expand. Because they are unusually dependent upon the economic well-being of the surrounding communities, they are ideally suited to mobilize resources and keep their programming flexible and responsive.

As pointed out in the recent report "Putting America Back to Work" by the American Association of Community and Junior Colleges: ". . . the match is remarkably tight between what our nation needs at this point in its history and the services that community colleges can provide. . . it is crucial that the resources of the American education system, with a stress on the technological education available through community, technical and junior colleges . . . be fully applied to the problems . . . in cooperation with business and industry."

Mr. Chairman, I strongly believe that our nation's two-year colleges have a critical role to play in technology training. Before they can do that, though, they must be able to tie into this technology. This is the challenge that Congress must meet: we simply don't have any practical way to move our best technological research and education into regions and industries that need them. We have a massive research and education infrastructure in this country—already paid for—but we seem to be reluctant to take any significant steps to tap this infrastructure. Let me give an example and suggest one way to work at the problem.

Just a few weeks ago, researchers at Massachusetts General Hospital reported that a powerful new laser being developed for the military's "Star Wars"—a beam weapon designed to shoot down Soviet missiles from space—may have important medical uses. Such uses include treating tumors, improving surgery and even operating inside human cells.

In what is apparently a unique spin-off of the government's military program, Congress has required that part of the money for "Star Wars" laser research be applied to medicine. The hospital and three other medical centers are to share in funds for this research.

This would be wonderful news, except for two problems. First, the money going for this medical research is only $10 million—$10 million out of several billions that are projected to go to "Star Wars" research alone this year. Next, events such as these are all too rare—at least compared to the potential that could be realized from the many billions we are currently spending on military research and development.

Because of problems such at these, and others, I added an amendment this summer to the fiscal year 1986 defense authorization bill, HR 1872. My amendment, which passed the House unopposed and was later agreed to in conference with the Senate, gives the Department of Defense specific and direct authority to encourage the transfer of technology from DOD's laboratories and research centers to non-defense sources. This transfer would always be consistent with national security objectives, of course.

This is a real breakthrough. For the first time the Department of Defense will have direct authority—and is encouraged—to undertake technology transfer with other Federal agencies, state and local governments, universities and colleges, and private parties. Up to now the Pentagon had no specific mandate in its charter to transfer the research results of its nearly 180 laboratories and centers to the civilian sector. What efforts there were at technology transfer to the non-defense sector were random.

Such transfer is important because this year America is projected to spend about $107 billion on research and development, more than the combined R&D spending of Great Britain, France, West Germany and Japan. Moreover, about a third of this sum will be devoted to defense, including 85 percent of our research in advanced technologies. In the late 1970s, only half of federally-sponsored research was defense-related; now that figure stands at 70 percent!

To spend this much on defense research and somehow not encourage any non-defense application of such research is a waste of our nation's resources. The taxpayers paid for this research; they deserve to reap the maximum benefits possible from it. When we consider that these 180 defense laboratories and centers employ 105,000 scientists and engineers around the country and have a budget of $6 billion a year, we begin to appreciate how formidable this research base is.

Now, to be sure, this amendment doesn't open up the floodgates so that all Pentagon research is now a target for non-DOD use. But it does open up a good size crack in the wall that has fenced off such research in the past. This "crack" can only benefit our economy and strengthen any technology transfer efforts that have been undertaken so far.

I'm excited about the inclusion of my amendment into the defense bill. Pennsylvania has a number of defense laboratories and centers. They can contribute to our state's economic development and doesn't follow jobs generated by such development. I'm even more excited, however, about the potential of the rest of the federally-supported research base in the country that is untapped. The DOD laboratories and centers are only part of this base. Community colleges need to tie into this base.

This base has never been so critical as it is today. Our future economic growth and development, as well as our position in the competitive world marketplace, will depend increasingly on the quality of our technology and the ability of our basic industries to apply that technology with proficency and imagination.

In closing, Mr. Chairman, let me say that this innovative spirit will thrive only if our research and education system offers strong support for the basic sciences and engineering, and then only if our society provides a practical means of extending the benefits of that research and education to the industries and regions that need them.

Cooperation between the academic community, including two year colleges, and industry is essential if the promise of new technology is to be translated into greater productivity, an improved national economy, and enhanced citizen satisfaction.

However, the national resources available for improving technology-related higher education—including continuing education for our nation's scientists and engineers, technology education at two-year colleges, and promoting technology extension—are presently inadequate to meet these national goals. A nationwide effort by institutions of higher education (including two year colleges), industry and government—with each acting in its proper sphere—can most effectively promote the improvement of scientific, engineering, and technical education in colleges and universities and provide for the extension of high technology skills in areas and regions where they are vitally needed.

Thank you.

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